

Revision:C

• The fan guard for MUH-GA60VB- **E1** and MUH-GA80VB- **E1** has been changed.
Please void OB368 REVISED EDITION-B.

OUTDOOR UNIT

SERVICE MANUAL

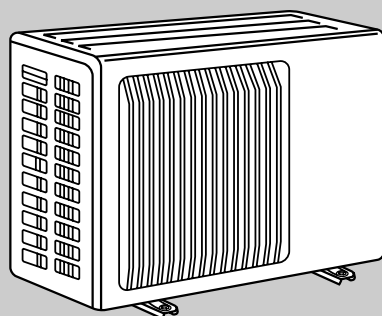


No. OB368
REVISED EDITION-C

Models

MUH-GA50VB	- E1
MUH-GA50VB	- E2
MUH-GA60VB	- E1
MUH-GA80VB	- E1

Indoor unit service manual
MSH-GA-VB Series (OB367)



MUH-GA50VB

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NOTE:

This service manual describes technical data of outdoor units.
RoHS compliant products have <G> mark on the spec name plate.
For servicing of RoHS compliant products, refer to the RoHS Parts List.



Revision:A

- RoHS PARTS LIST has been added.

Revision:B

- MUH-GA50VB-E2 has been added.

Revision:C

- The fan guard for MUH-GA60VB-E1 and MUH-GA80VB-E1 has been changed.

1**TECHNICAL CHANGES****MUH-A18WV -E1→MUH-GA50VB -E1**

1. Oil separator has been removed.
2. Model name has been changed.
Indication of capacity has been changed. (BTU→kW)

MUH-A24WV -E1→MUH-GA60VB -E1**MUH-A30WV -E1→MUH-GA80VB -E1**

1. Model name has been changed.
Indication of capacity has been changed. (BTU→kW)

MUH-GA50VB -E1→MUH-GA50VB -E2

1. Outdoor heat exchanger has been changed. (1 row → 2 row)
2. Outdoor fan motor has been changed.
3. Oil separator has been added.

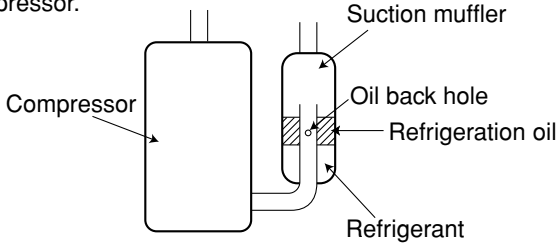
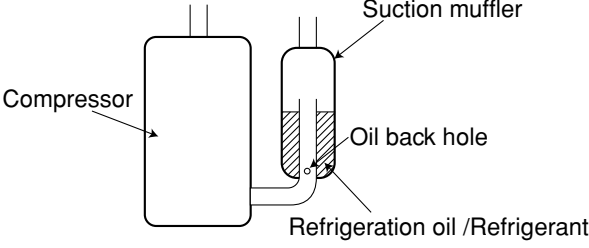
INFORMATION FOR THE AIR CONDITIONER WITH R410A REFRIGERANT

- This room air conditioner adopts an HFC refrigerant (R410A) which never destroys the ozone layer.
 - Pay particular attention to the following points, though the basic installation procedure is same as that for R22 conditioners.
- ① As R410A has working pressure approximate 1.6 times as high as that of R22, some special tools and piping parts/materials are required. Refer to the table below.
 - ② Take sufficient care not to allow water and other contaminations to enter the R410A refrigerant during storage and installation, since it is more susceptible to contaminations than R22.
 - ③ For refrigerant piping, use clean, pressure-proof parts/materials specifically designed for R410A. (Refer to 2. Refrigerant piping.)
 - ④ Composition change may occur in R410A since it is a mixed refrigerant. When charging, charge liquid refrigerant to prevent composition change.

		New refrigerant	Previous refrigerant
Refrigerant	Refrigerant	R410A	R22
	Composition (Ratio)	HFC-32: HFC-125 (50%:50%)	R22 (100%)
	Refrigerant handling	Pseudo-azeotropic refrigerant	Single refrigerant
	Chlorine	Not included	Included
	Safety group (ASHRAE)	A1/A1	A1
	Molecular weight	72.6	86.5
	Boiling point (°C)	-51.4	-40.8
	Steam pressure [25°C](Mpa)	1.557	0.94
	Saturated steam density [25°C](Kg/m³)	64	44.4
	Combustibility	Non combustible	Non combustible
	ODP ※1	0	0.055
	GWP ※2	1730	1700
	Refrigerant charge method	From liquid phase in cylinder	Gas phase
	Additional charge on leakage	Possible	Possible
Refrigerating oil	Kind	Incompatible oil	Compatible oil
	Color	Non	Light yellow
	Smell	Non	Non

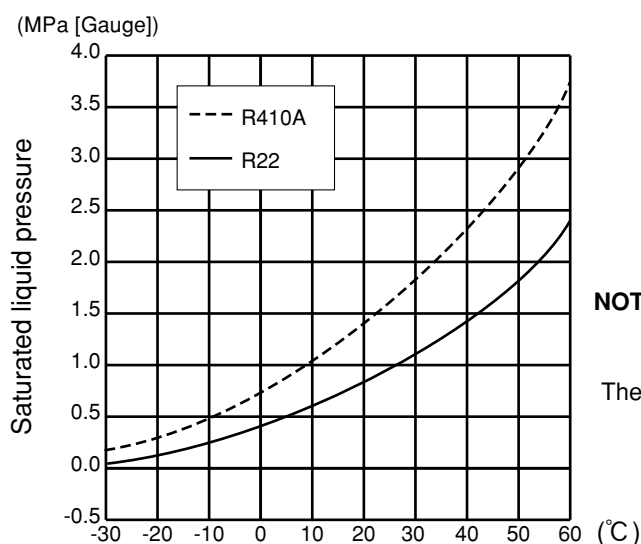
※1 :Ozone Depletion Potential : based on CFC-11

※2 :Global Warming Potential : based on CO₂

	New Specification	Current Specification
Compressor	<p>The incompatible refrigeration oil easily separates from refrigerant and is in the upper layer inside the suction muffler. Raising position of the oil back hole enables to back the refrigeration oil of the upper layer to flow back to the compressor.</p> 	<p>Since refrigerant and refrigeration oil are compatible each, refrigeration oil backs to the compressor through the lower position oil back hole.</p> 

NOTE : The unit of pressure has been changed to MPa on the international system of units(SI unit system).
The conversion factor is: **1(MPa [Gauge]) =10.2(kgf/cm² [Gauge])**

Conversion chart of refrigerant temperature and pressure



NOTE : The unit of pressure has been changed to MPa on the international system of units(SI unit system).

The conversion factor is: **1(MPa [Gauge]) =10.2(kgf/cm² [Gauge])**

1.Tools dedicated for the air conditioner with R410A refrigerant

The following tools are required for R410A refrigerant. Some R22 tools can be substituted for R410A tools.

The diameter of the service port on the stop valve in outdoor unit has been changed to prevent any other refrigerant being charged into the unit. Cap size has been changed from 7/16 UNF with 20 threads to 1/2 UNF with 20 threads.

R410A tools	Can R22 tools be used?	Description
Gauge manifold	No	R410A has high pressures beyond the measurement range of existing gauges. Port diameters have been changed to prevent any other refrigerant from being charged into the unit.
Charge hose	No	Hose material and cap size have been changed to improve the pressure resistance.
Gas leak detector	No	Dedicated for HFC refrigerant.
Torque wrench	Yes	6.35 mm and 9.52 mm
	No	12.7 mm and 15.88 mm
Flare tool	Yes	Clamp bar hole has been enlarged to reinforce the spring strength in the tool.
Flare gauge	New	Provided for flaring work (to be used with R22 flare tool).
Vacuum pump adapter	New	Provided to prevent the back flow of oil. This adapter enables you to use vacuum pumps.
Electronic scale for refrigerant charging	New	It is difficult to measure R410A with a charging cylinder because the refrigerant bubbles due to high pressure and high-speed vaporization

No : Not Substitutable for R410A Yes : Substitutable for R410A

2.Refrigerant piping

① Specifications

Use the refrigerant pipes that meet the following specifications.

Pipe	Outside diameter	Wall thickness	Insulation material
	mm		
For liquid	6.35	0.8 mm	Heat resisting foam plastic Specific gravity 0.045 Thickness 8 mm
	9.52	0.8 mm	
For gas	12.7	0.8 mm	
	15.88	1.0 mm	

- Use a copper pipe or a copper-alloy seamless pipe with a thickness of 0.8 mm (6.35, 9.52, 12.7), 1.0 mm (15.88). Never use any pipe with a thickness less than 0.8 mm (6.35, 9.52, 12.7), 1.0 mm (15.88), as the pressure resistance is insufficient.

② Flaring work and flare nut

Flaring work for R410A pipe differs from that for R22 pipe.

For details of flaring work, refer to Installation manual "FLARING WORK".

Pipe diameter	Dimension of flare nut	
	R410A	R22
mm		
6.35	17	17
9.52	22	22
12.7	26	24
15.88	29	27

3.Refrigerant oil

Apply the special refrigeration oil (accessories: packed with indoor unit) to the flare and the union seat surfaces.

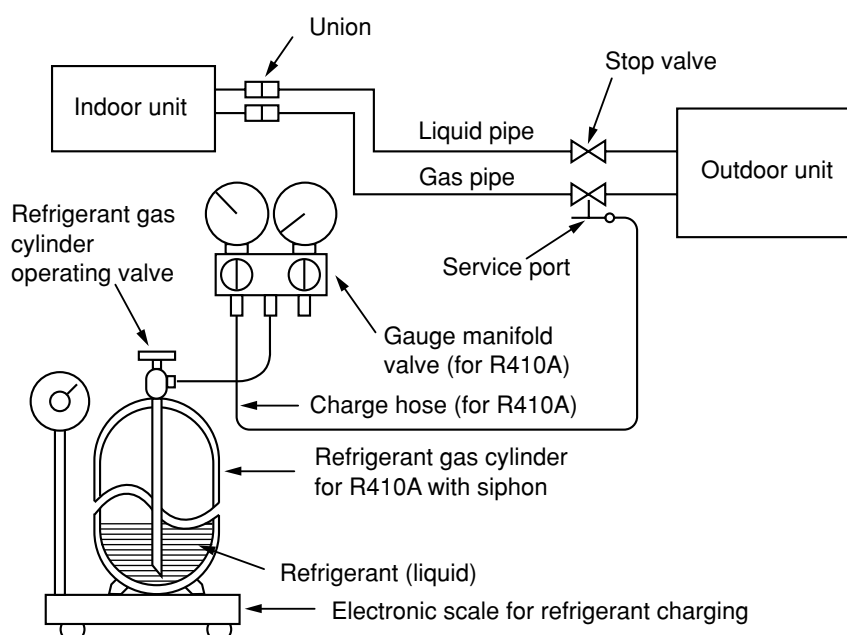
4.Air purge

- Do not discharge the refrigerant into the atmosphere.
Take care not to discharge refrigerant into the atmosphere during installation, reinstallation, or repairs to the refrigerant circuit.
- Use the vacuum pump for air purging for the purpose of environmental protection.

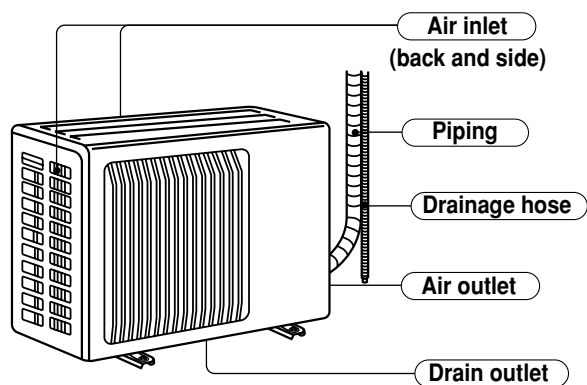
5.Additional charge

For additional charging, charge the refrigerant from liquid phase of the gas cylinder.

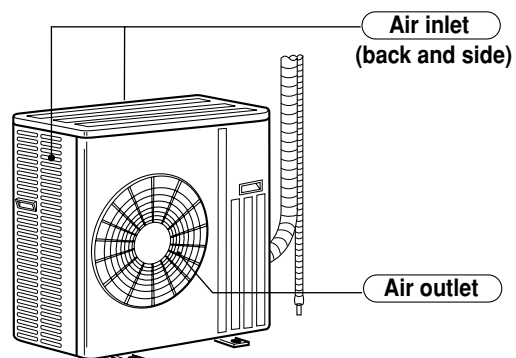
If the refrigerant is charged from the gas phase, composition change may occur in the refrigerant inside the cylinder and the outdoor unit. In this case, ability of the refrigerating cycle decreases or normal operation can be impossible. However, charging the liquid refrigerant all at once may cause the compressor to be locked. Thus, charge the refrigerant slowly.



MUH-GA50VB



MUH-GA60VB MUH-GA80VB



ACCESSORIES

		MUH-GA50VB	MUH-GA60VB MUH-GA80VB
①	Drain socket	1	1
②	Drain cap $\phi 33$	2	2
	Drain cap $\phi 16$	1	—

Outdoor model			MUH-GA50VB		MUH-GA60VB	
Function			Cooling	Heating	Cooling	Heating
Power supply			Single phase 230V, 50Hz		Single phase 230V, 50Hz	
Capacity	Capacity	kW	5.0	5.2	6.3	7.2
	Dehumidification	ℓ /h	2.5	—	3.2	—
	Air flow(High)	m³ /h	2,196		2,760	
Electrical data	Power outlet	A	15		25	
	Running current	A	7.93	7.23	10.39	10.70
	Power input	W	1,720	1,550	2,350	2,420
	Power factor	%	94	93	98	98
	Starting current	A	37		74	
	Compressor motor current	A	7.54	6.84	9.81	10.12
	Fan motor current	A	0.39		0.58	
	Coefficient of performance(C.O.P)		2.81	3.23	2.61	2.90
Compressor	Model		RN196VHSHT		NN29VBAHT	
	Output	W	1,300		1,900	
	Winding resistance(at 20℃)	Ω	C-R 1.80 C-S 3.00		C-R 0.80 C-S 1.64	
Fan motor	Model		E1 RA6V50-PA	RA6V85-DA		
			E2 RA6V60-MA			
	Winding resistance(at 20℃)	Ω	E1 WHT-BLK 79.5 BLK-RED 83.0	WHT-BLK 68.8 BLK-RED 93.1		
			E2 WHT-BLK 71.2 BLK-RED 89.3			
Dimensions W×H×D		mm	850×605×290			
Weight		kg	47			
Special remarks	Sound level(High)	dB	52			
	Fan speed(High)	rpm	828			
	Fan speed regulator		1			
	Refrigerant filling capacity(R410A)	kg	1.80			
	Refrigeration oil (Model)	cc	520 (NEO22)			
	Thermistor RT61(at 0℃)	kΩ	33.18			
			33.18			

NOTE: Test conditions are based on ISO5151.

Cooling : Indoor DB27°C WB19°C

Outdoor DB35°C WB(24°C)

Indoor-Outdoor piping length : 5m

Heating : Indoor DB20°C WB 15.5°C

Outdoor DB 7°C WB 6°C

Outdoor model			MUH-GA80VB	
Function			Cooling	Heating
Power supply			Single phase 230V, 50Hz	
Capacity	Capacity	kW	8.5	9.4
	Dehumidification	ℓ /h	4.6	—
	Air flow(High/Low)	m³ /h	2,940/1,470	2,940/1,470
Electrical data	Power outlet	A	25	
	Running current	A	14.42	15.19
	Power input	W	3,191	3,361
	Power factor	%	96	96
	Starting current	A	90	
	Compressor motor current	A	13.85	14.62
	Fan motor current	A	0.57	
Coefficient of performance(C.O.P)			2.61	2.74
Compressor	Model		NN37VAAHT	
	Output	W	2,500	
	Winding resistance(at 20°C)	Ω	C-R 0.64 C-S 1.63	
Fan motor	Model		RA6V75-AD	
	Winding resistance(at 20°C)	Ω	WHT-BLK 62.8 BLK-YLW 55.9 YLW-RED 26.0	
	Dimensions W×H×D	mm	840×850×330	
Weight		kg	77	
Special remarks	Sound level(High/Low)	dB	55/53	
	Fan speed(High/Low)	rpm	805/435	
	Fan speed regulator		2	
	Refrigerant filling capacity(R410A)	kg	2.40	
	Refrigeration oil (Model)	cc	1,300 (NEO 22)	
	Thermistor RT61(at 0°C)	kΩ	33.18	
	Thermistor RT62(at 25°C)	kΩ	231.44	
	Thermistor RT63(at 0°C)	kΩ	33.18	

NOTE: Test conditions are based on ISO5151.

Cooling : Indoor DB27°C WB19°C
Outdoor DB35°C WB(24°C)
Indoor-Outdoor piping length : 5m

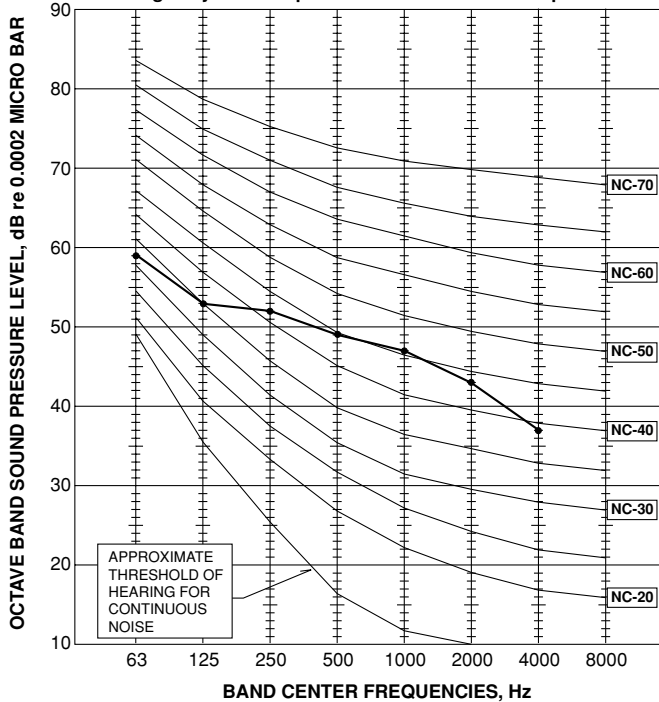
Heating : Indoor DB20°C WB 15.5°C
Outdoor DB 7°C WB 6°C

MUH-GA50VB

FAN SPEED	SPL(dB(A))	LINE
High	52	● — ●

Test conditions,

Cooling : Dry-bulb temperature 35°C Wet-bulb temperature 24°C
 Heating : Dry-bulb temperature 7°C Wet-bulb temperature 6°C

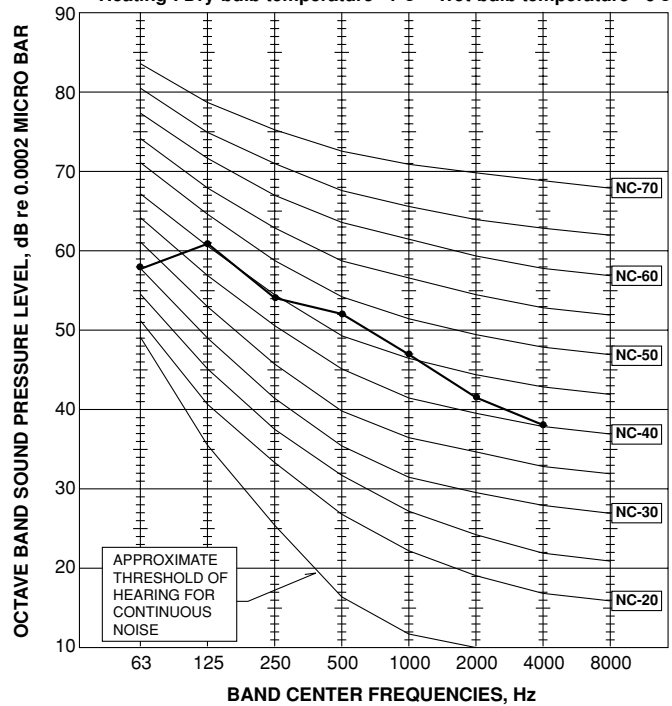


MUH-GA60VB

FAN SPEED	SPL(dB(A))	LINE
High	53	● — ●

Test conditions,

Cooling : Dry-bulb temperature 35°C Wet-bulb temperature 24°C
 Heating : Dry-bulb temperature 7°C Wet-bulb temperature 6°C

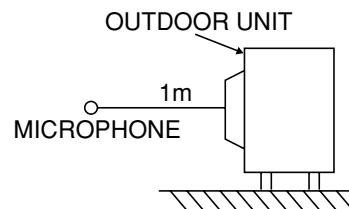
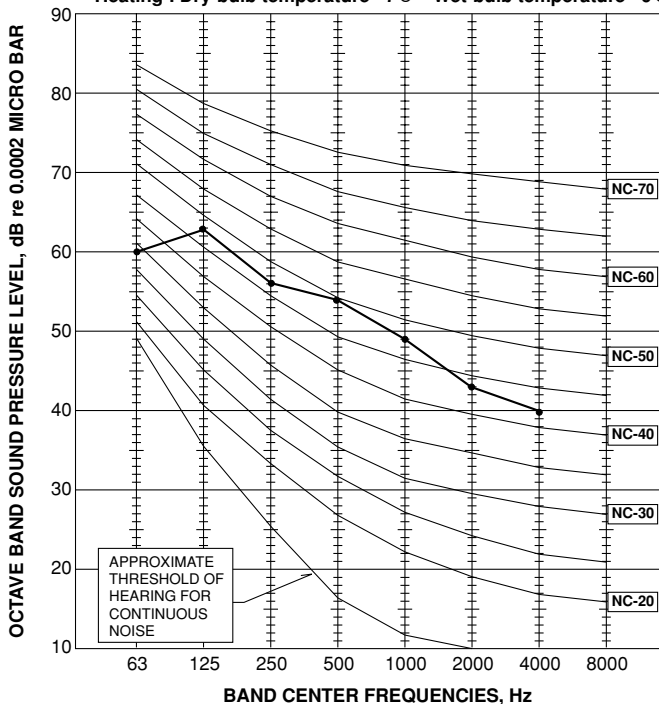


MUH-GA80VB

FAN SPEED	SPL(dB(A))	LINE
High	55	● — ●

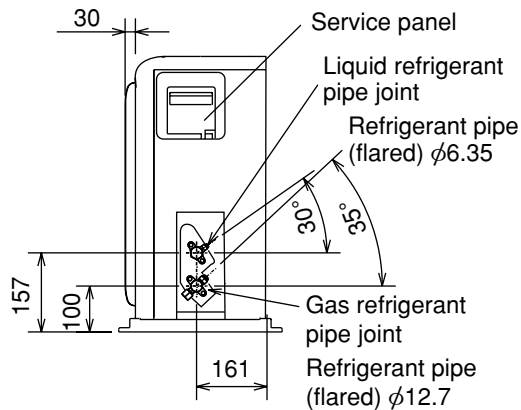
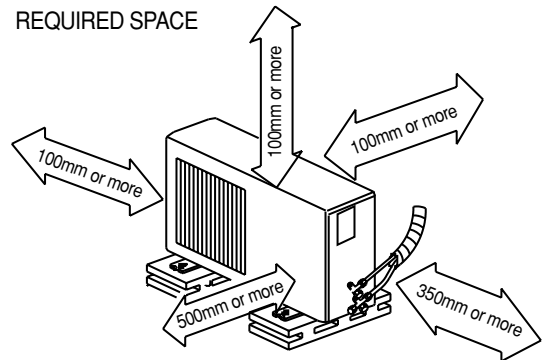
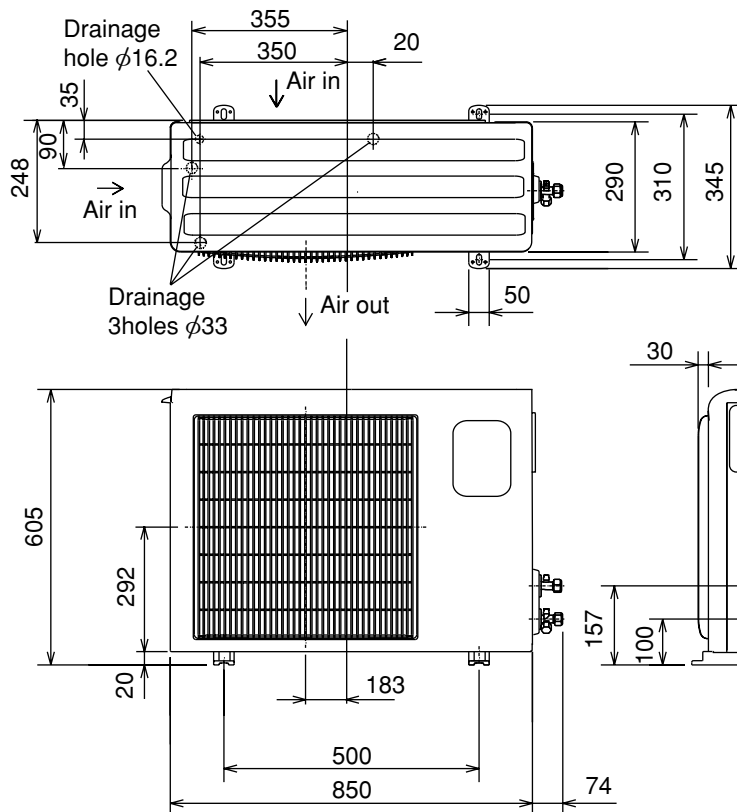
Test conditions,

Cooling : Dry-bulb temperature 35°C Wet-bulb temperature 24°C
 Heating : Dry-bulb temperature 7°C Wet-bulb temperature 6°C

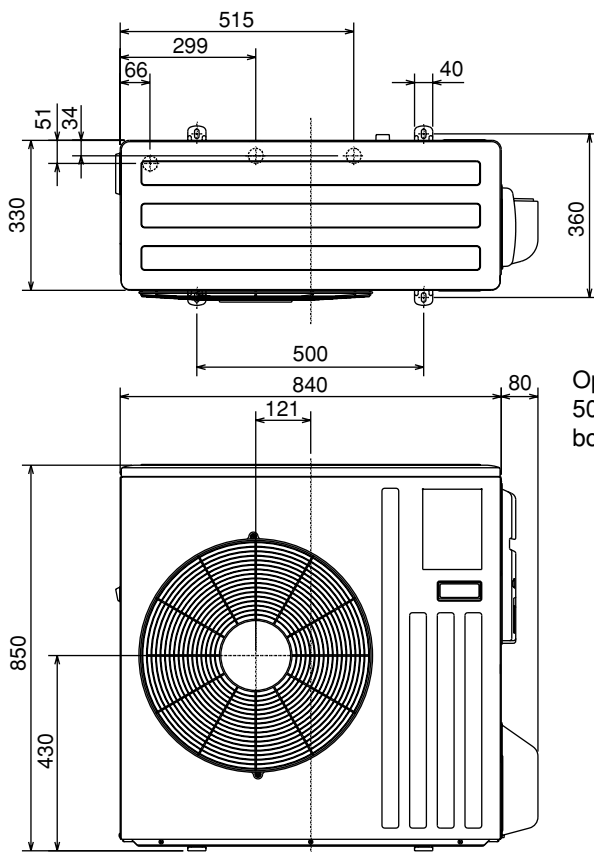


MUH-GA50VB

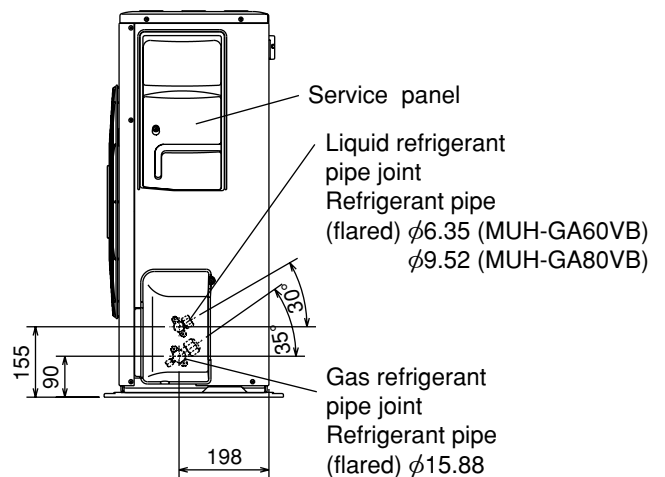
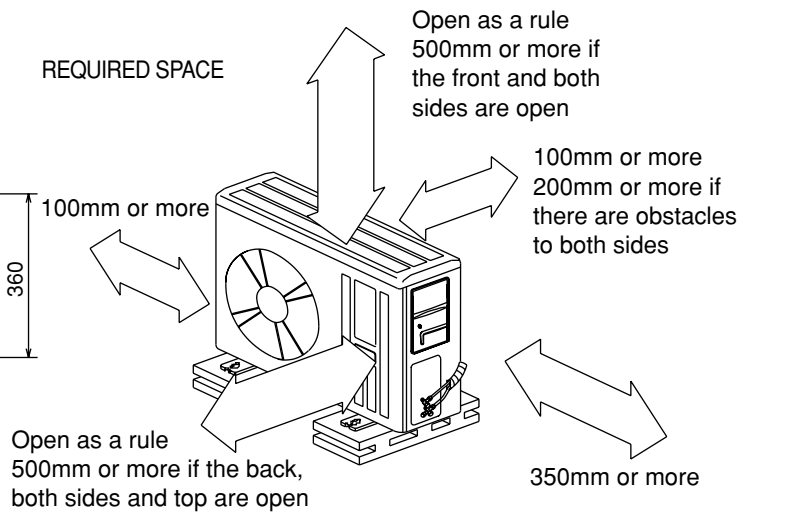
Unit: mm



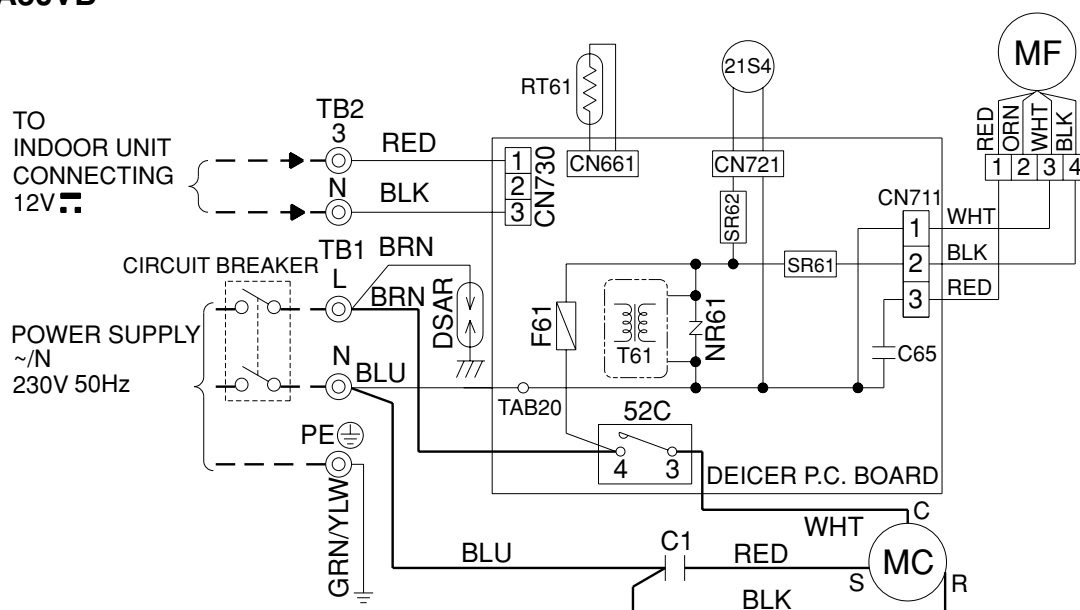
MUH-GA60VB MUH-GA80VB



REQUIRED SPACE



MUH-GA50VB



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C1	COMPRESSOR CAPACITOR	MF	OUTDOOR FAN MOTOR (INNER PROTECTOR)	TB1, TB2	TERMINAL BLOCK
C65	OUTDOOR FAN CAPACITOR	NR61	VARISTOR	21S4	R.V. COIL
DSAR	SURGE ABSORBER	RT61	DEFROST THERMISTOR	52C	COMPRESSOR CONTACTOR
F61	FUSE (2A)	SR61, SR62	SOLID STATE RELAY		
MC	COMPRESOR (INNER PROTECTOR)	T61	TRANSFORMER		

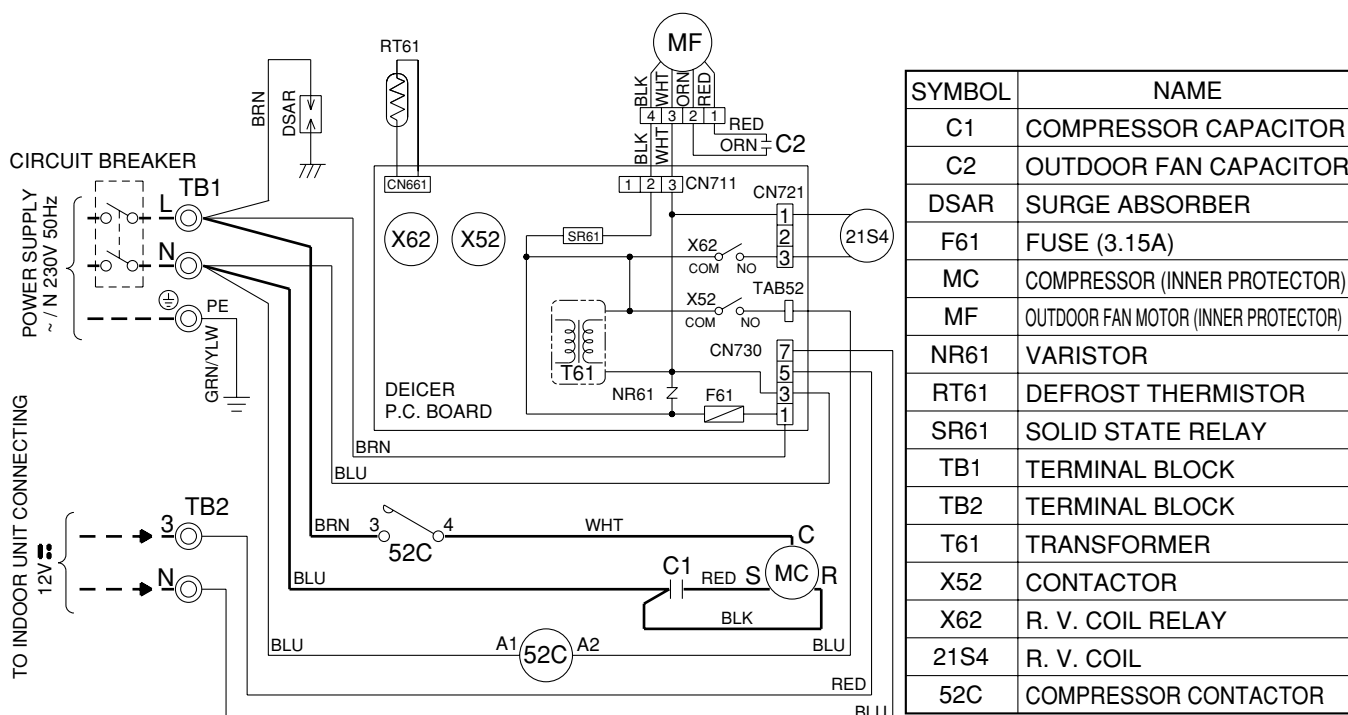
NOTES: 1. About the indoor side electric wiring refer to the indoor unit electric wiring diagram for servicing.

2. Use copper conductors only. (For field wiring)

3. Symbols below indicate.

⊙ : Terminal block □ : Connector

MUH-GA60VB



SYMBOL	NAME
C1	COMPRESSOR CAPACITOR
C2	OUTDOOR FAN CAPACITOR
DSAR	SURGE ABSORBER
F61	FUSE (3.15A)
MC	COMPRESSOR (INNER PROTECTOR)
MF	OUTDOOR FAN MOTOR (INNER PROTECTOR)
NR61	VARISTOR
RT61	DEFROST THERMISTOR
SR61	SOLID STATE RELAY
TB1	TERMINAL BLOCK
TB2	TERMINAL BLOCK
T61	TRANSFORMER
X52	CONTACTOR
X62	R. V. COIL RELAY
21S4	R. V. COIL
52C	COMPRESSOR CONTACTOR

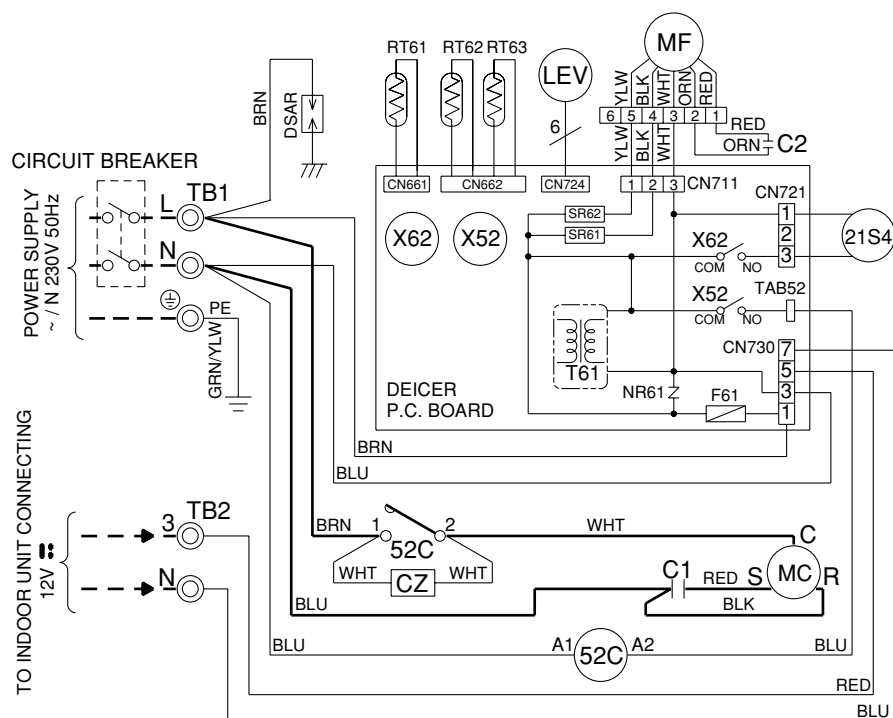
NOTES: 1. Use copper conductors only. (For field wiring).

2. Since the indoor and outdoor unit connecting wires have polarity, connect them according to the numbers (3, N).

3. Symbols below indicate.

⊙ : Terminal block, □ : Connector

MUH-GA80VB

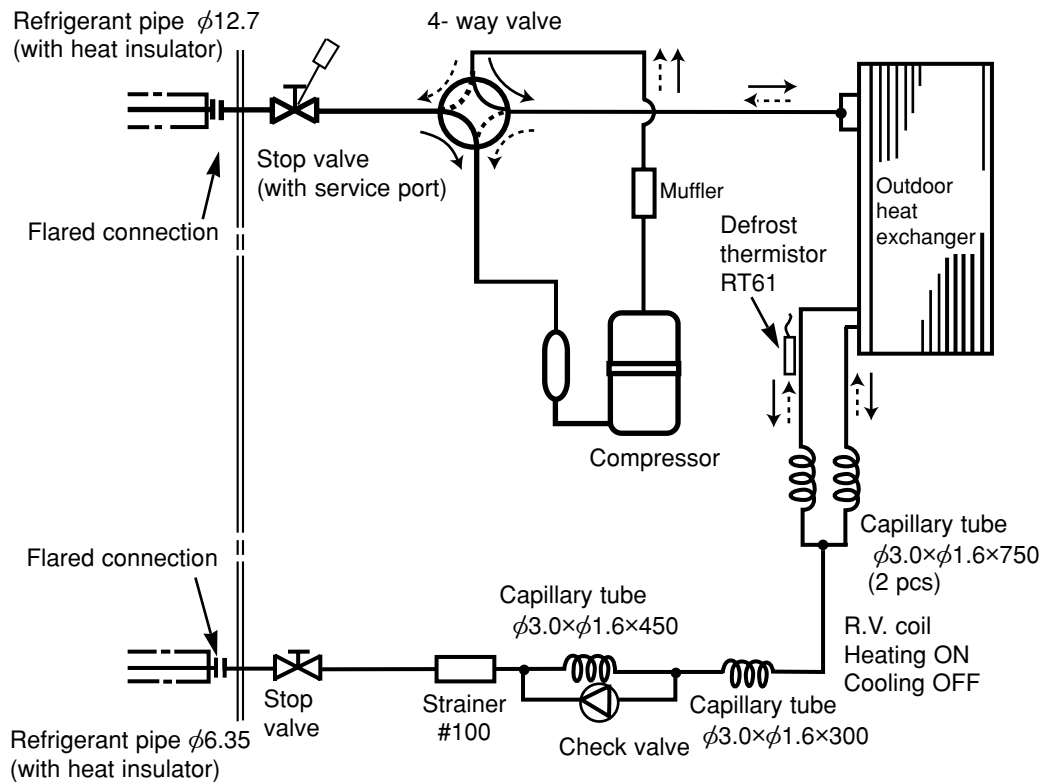


SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CZ	CZ SURGE ABSORBER	MF	OUTDOOR FAN MOTOR (INNER PROTECTOR)	TB1	TERMINAL BLOCK
C1	COMPRESSOR CAPACITOR	NR61	VARISTOR	TB2	TERMINAL BLOCK
C2	OUTDOOR FAN CAPACITOR	RT61	DEFROST THERMISTOR	T61	TRANSFORMER
DSAR	SURGE ABSORBER	RT62	DISCHARGE TEMPERATURE THERMISTOR	X52	CONTACTOR
F61	FUSE(3.15A)	RT63	AMBIENT TEMPERATURE THERMISTOR	X62	R.V. COIL RELAY
LEV	EXPANSION VALVE COIL	SR61	SOLID STATE RELAY	21S4	R.V. COIL
MC	COMPRESSOR (INNER PROTECTOR)	SR62	SOLID STATE RELAY	52C	COMPRESSOR CONTACTOR

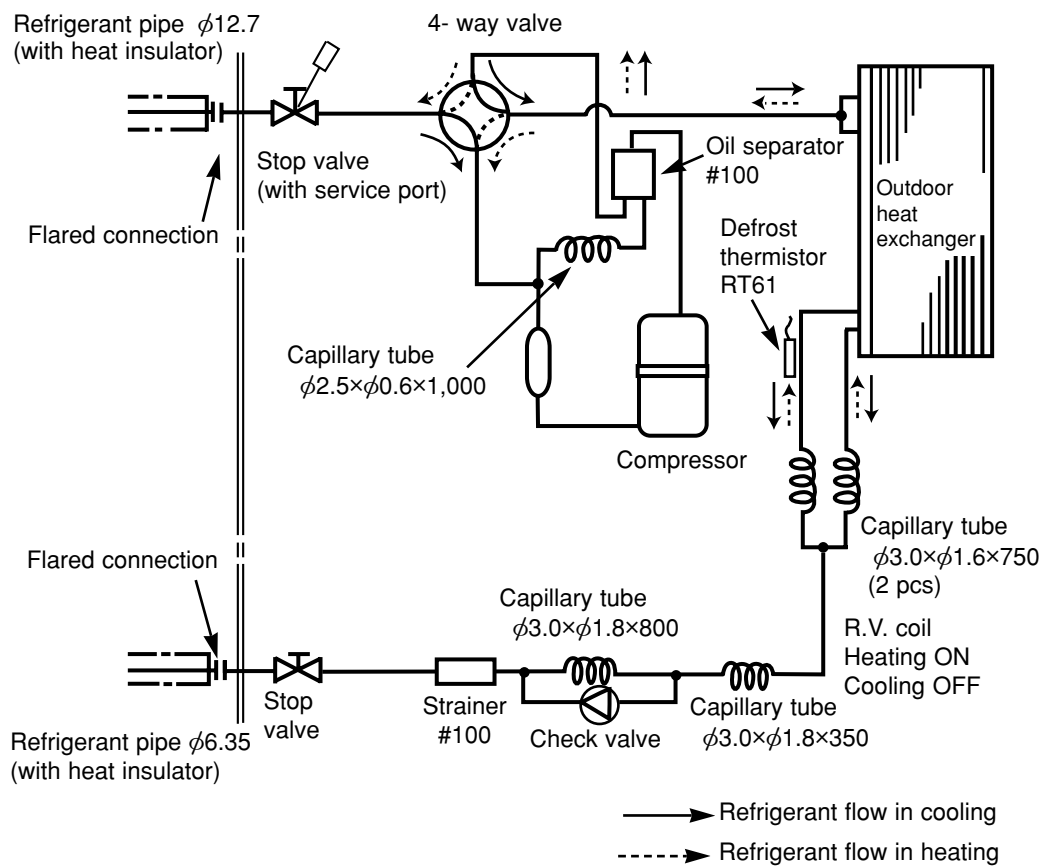
NOTES: 1. Use copper conductors only (For field wiring).
 2. Since the indoor and outdoor unit connecting wires have polarity, connect them according to the numbers (3,N).
 3. Symbols below indicate.
 ◎ : Terminal block, □□□□ : Connector

MUH-GA50VB -[E1]

Unit:mm

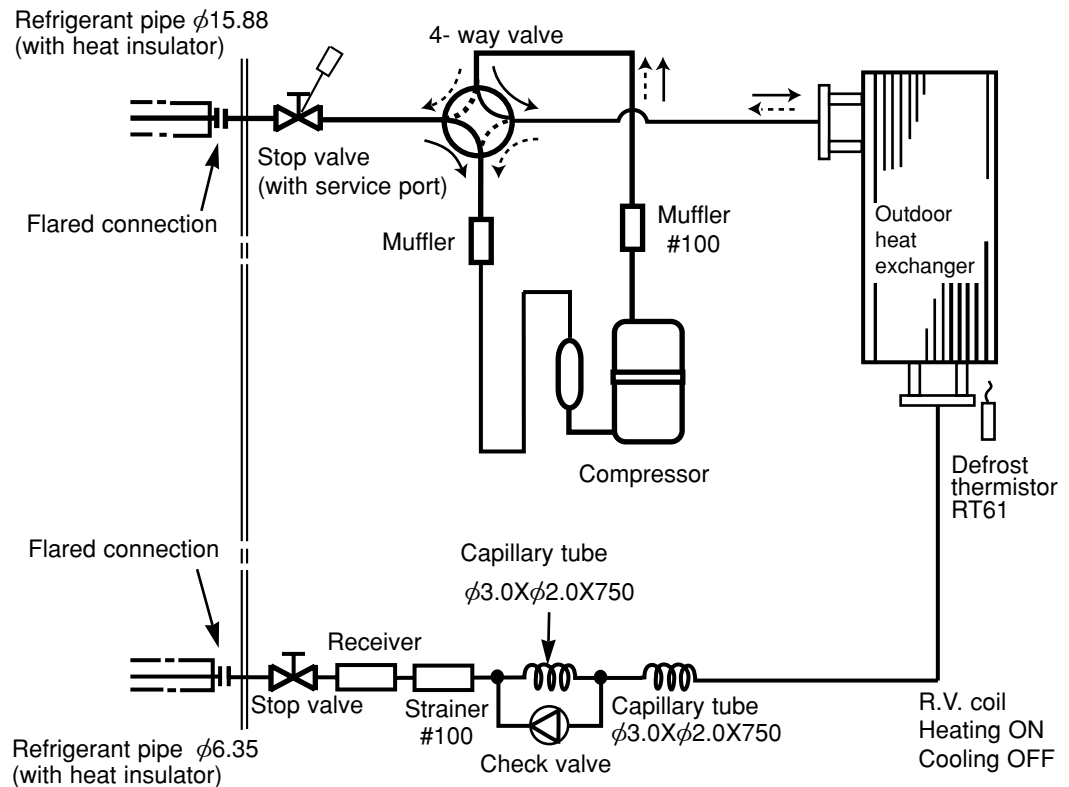


MUH-GA50VB -[E2]

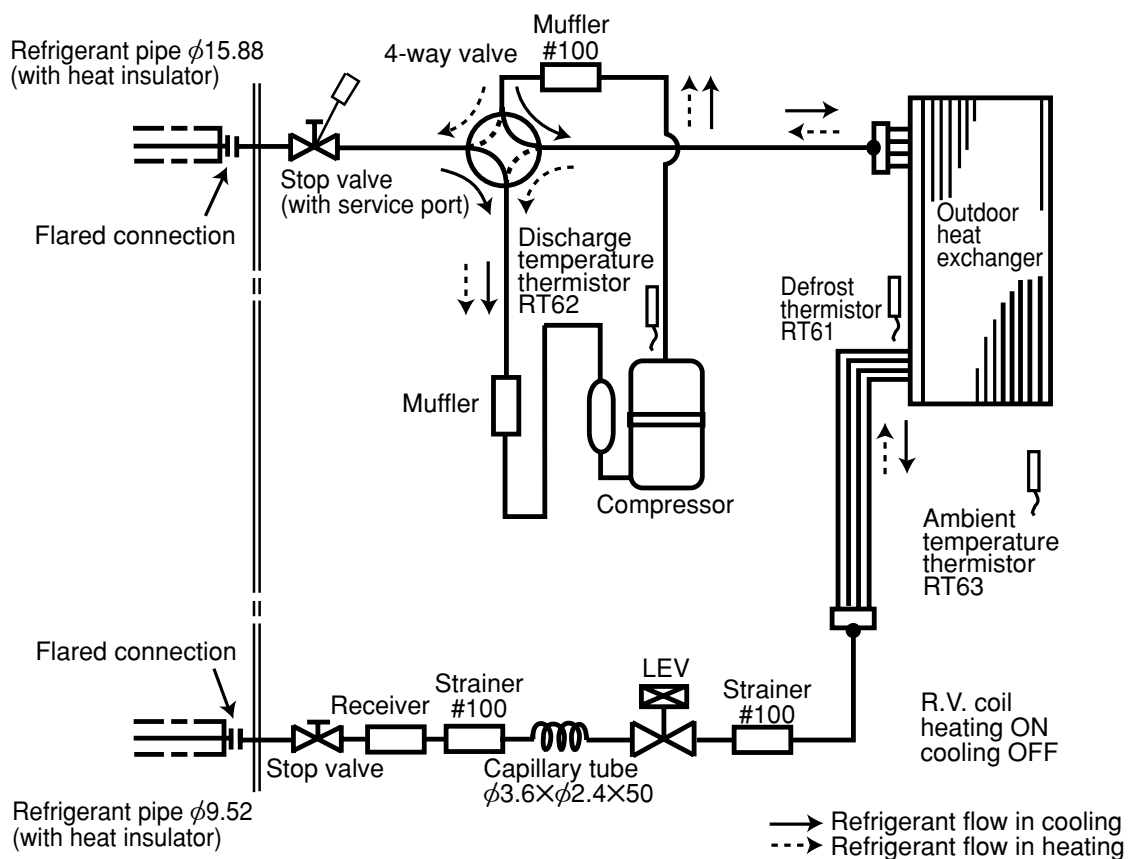


MUH-GA60VB

Unit:mm



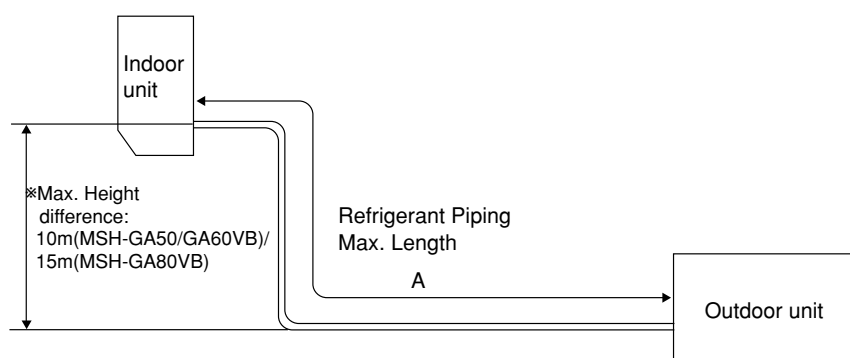
MUH-GA80VB



MAX. REFRIGERANT PIPING LENGTH

Model	Refrigerant piping Max. length : m A	Piping size O.D : mm	
		Gas	Liquid
MUH-GA50VB	25	12.7	6.35
MUH-GA60VB		15.88	
MUH-GA80VB	30		

MAX. HEIGHT DIFFERENCE



* Height difference should be within 10m(MSH-GA50VB/GA60VB)/
15m(MSH-GA80VB) regardless of which unit, indoor or outdoor position is high.

ADDITIONAL REFRIGERANT CHARGE(R410A : g)

Model	Outdoor unit precharged	Refrigerant piping length (one way)				
		7m	10m	15m	20m	25m
MUH-GA50VB	1,800	0	60	160	260	360

Calculation : $Xg = 20g/m \times (\text{Refrigerant piping length (m)} - 7)$

Model	Outdoor unit precharged	Refrigerant piping length (one way)				
		7m	10m	15m	20m	25m
MUH-GA60VB	2,350	0	60	160	260	360

Calculation : $Xg = 20g/m \times (\text{Refrigerant piping length (m)} - 7)$

Model	Outdoor unit precharged	Refrigerant piping length (one way)					
		7m	10m	15m	20m	25m	30m
MUH-GA80VB	2,400	0	165	440	715	990	1,265

Calculation : $Xg = 55g/m \times (\text{Refrigerant piping length (m)} - 7)$

MUH-GA50VB MUH-GA60VB MUH-GA80VB

The standard specifications apply only to the operation of the air conditioner under normal conditions, since operating conditions vary according to the areas where these units are installed. The following information has been provided to clarify the operating characteristics of the air conditioner under the conditions indicated by the performance curve.

(1) GUARANTEED VOLTAGE

198 ~ 264V, 50Hz

(2) AIR FLOW

Air flow should be set at MAX.

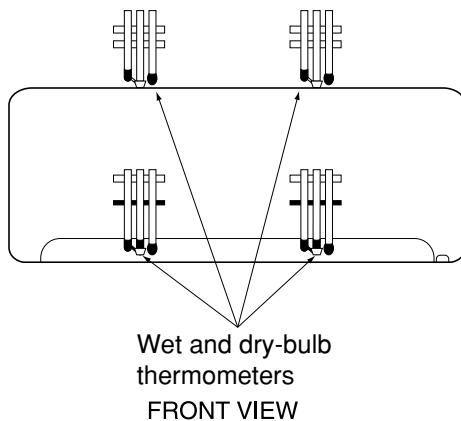
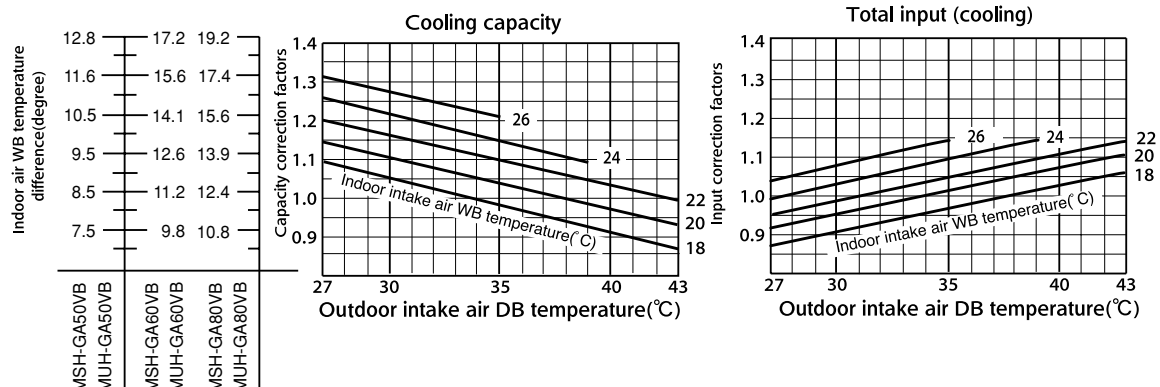
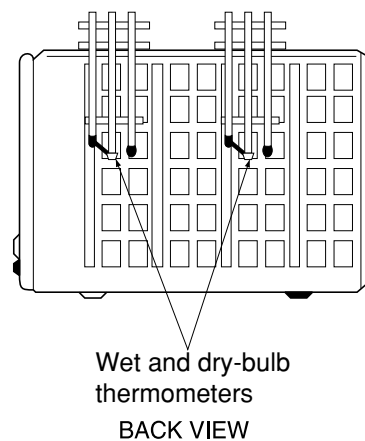
(3) MAIN READINGS

(1) Indoor intake air wet-bulb temperature :	°CWB	} Cooling
(2) Indoor outlet air wet-bulb temperature :	°CWB	
(3) Outdoor intake air dry-bulb temperature :	°CDB	
(4) Total input:	W	
(5) Indoor intake air dry-bulb temperature :	°CDB	} Heating
(6) Outdoor intake air wet-bulb temperature :	°CWB	
(7) Total input :	W	

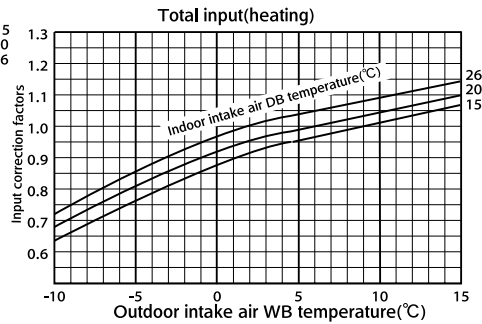
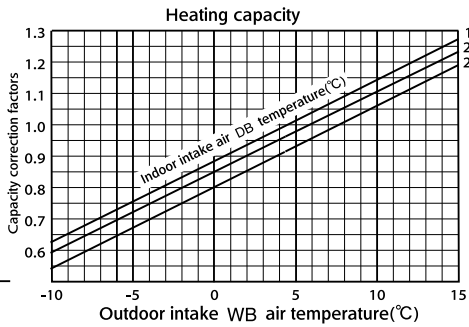
Indoor air wet/dry-bulb temperature difference on the left side of the chart on this page and next page shows the difference between the indoor intake air wet/dry-bulb temperature and the indoor outlet air wet/dry-bulb temperature for your reference at service.

How to measure the indoor air wet-bulb/dry-bulb temperature difference

1. Attach at least 2 sets of wet and dry-bulb thermometers to the indoor air intake as shown in the figure, and at least 2 sets of wet and dry-bulb thermometers to the indoor air outlet. The thermometers must be attached to the position where air speed is high.
2. Attach at least 2 sets of wet and dry-bulb thermometers to the outdoor air intake. Cover the thermometers to prevent direct rays of the sun.
3. Check that the air filter is cleaned.
4. Open windows and doors of room.
5. Press the EMERGENCY OPERATION switch once(twice) to start the EMERGENCY COOL(HEAT) MODE.
6. When system stabilizes after more than 15 minutes, measure temperature and take an average temperature.
7. 10 minutes later, measure temperature again and check that the temperature does not change.

INDOOR UNIT**OUTDOOR UNIT**

Indoor air DB temperature difference(°C)	26.6	36.8	38.4
	24.5	34.0	35.5
	22.5	31.1	32.5
	20.4	28.3	29.6
	18.4	25.5	26.6
	16.3	22.6	23.6
	14.3	19.8	20.7
	12.3	17.0	17.7
MSH-GA50VB			
MUH-GA50VB			
MSH-GA60VB			
MUH-GA60VB			
MSH-GA80VB			
MUH-GA80VB			



NOTE: The above curves are for the heating operation without any frost.

OUTDOOR LOW PRESSURE AND OUTDOOR UNIT CURRENT COOL operation

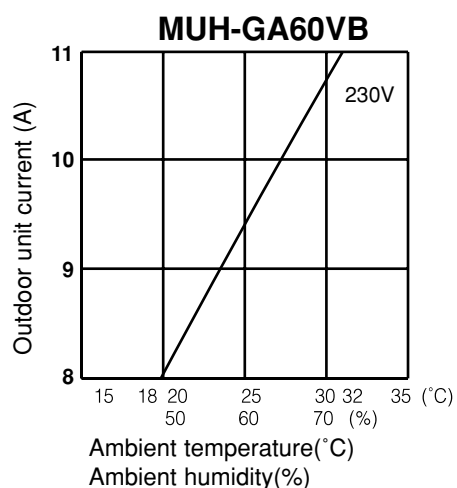
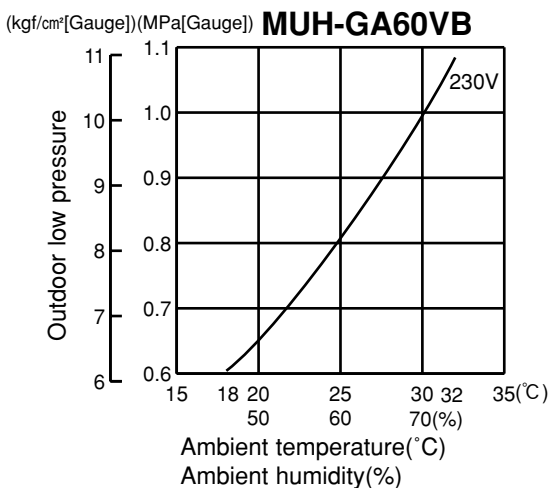
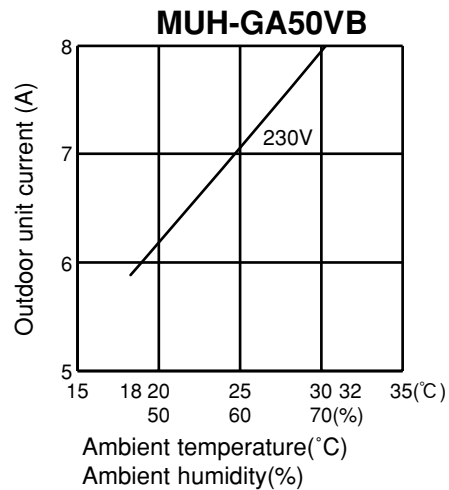
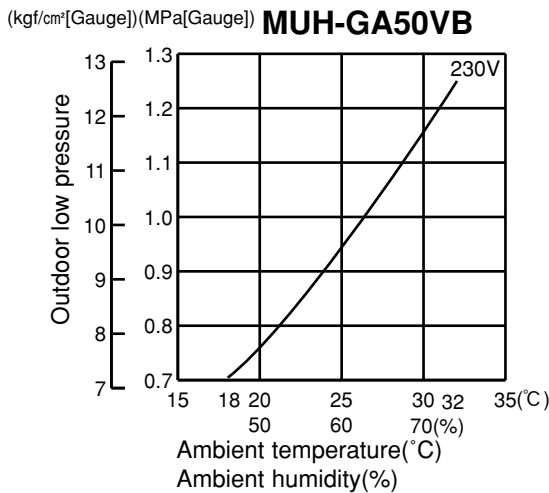
① Both indoor and outdoor unit are under the same temperature/humidity condition.

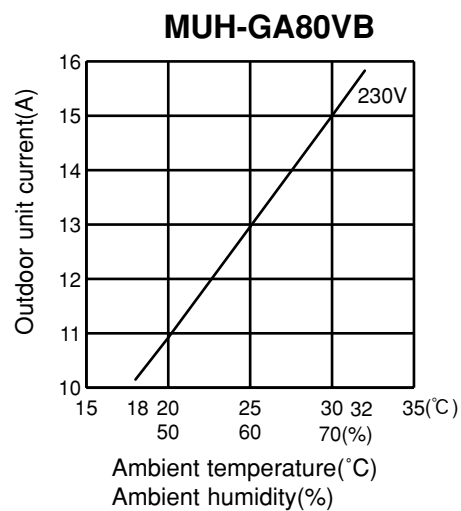
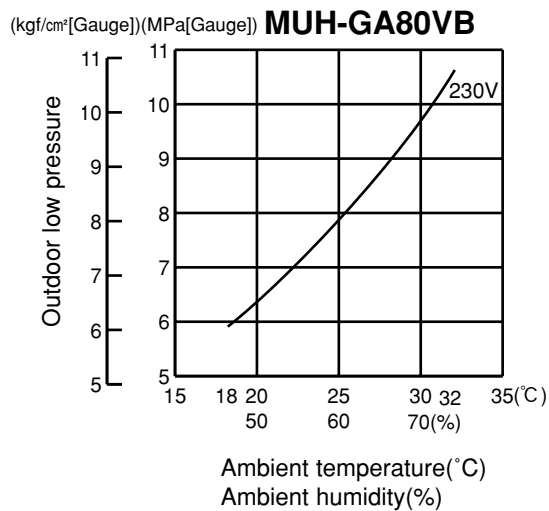
Dry-bulb temperature	Relative humidity(%)
20	50
25	60
30	70

② Air flow should be set at MAX.

③ The unit of pressure has been changed to MPa on the international system of units(SI unit system).

The conversion factor is : **1(MPa [Gauge]) = 10.2(kgf/cm² [Gauge])**

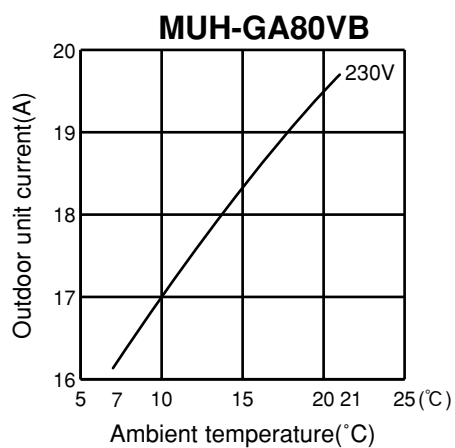
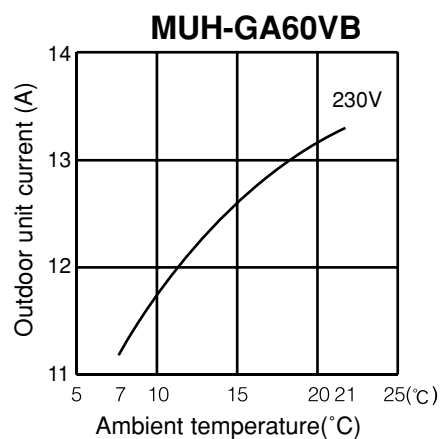
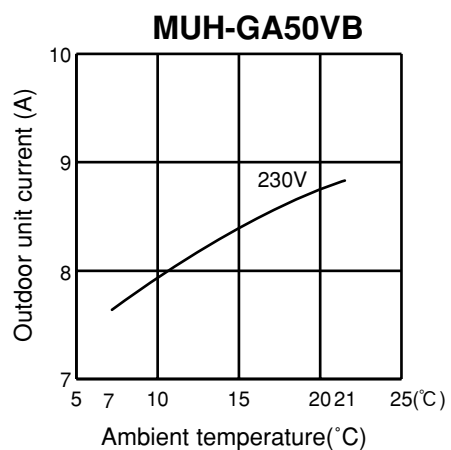




HEAT operation

Condition indoor: Dry bulb temperature 20.0°C
Wet bulb temperature 14.5°C

Outdoor: Dry bulb temperature 7, 15, 20°C
Wet bulb temperature 6, 12, 14.5°C



PERFORMANCE DATA COOL operation

MSH-GA50VB : MUH-GA50VB (230V)

CAPACITY : 5.0(kW) SHF : 0.65 INPUT : 1780(W)

		OUTDOOR DB(°C)															
INDOOR DB(°C)	INDOOR WB(°C)	21				25				27				30			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	5.88	2.76	0.47	1424	5.63	2.64	0.47	1495	5.40	2.54	0.47	1566	5.20	2.44	0.47	1638
21	20	6.13	2.14	0.35	1495	5.88	2.06	0.35	1584	5.70	2.00	0.35	1620	5.50	1.93	0.35	1691
22	18	5.88	3.00	0.51	1424	5.63	2.87	0.51	1495	5.40	2.75	0.51	1566	5.20	2.65	0.51	1638
22	20	6.13	2.39	0.39	1495	5.88	2.29	0.39	1584	5.70	2.22	0.39	1620	5.50	2.15	0.39	1691
22	22	6.38	1.72	0.27	1549	6.15	1.66	0.27	1647	6.00	1.62	0.27	1691	5.75	1.55	0.27	1762
23	18	5.88	3.23	0.55	1424	5.63	3.09	0.55	1495	5.40	2.97	0.55	1566	5.20	2.86	0.55	1638
23	20	6.13	2.63	0.43	1495	5.88	2.53	0.43	1584	5.70	2.45	0.43	1620	5.50	2.37	0.43	1691
23	22	6.38	1.98	0.31	1549	6.15	1.91	0.31	1647	6.00	1.86	0.31	1691	5.75	1.78	0.31	1762
24	18	5.88	3.47	0.59	1424	5.63	3.32	0.59	1495	5.40	3.19	0.59	1566	5.20	3.07	0.59	1638
24	20	6.13	2.88	0.47	1495	5.88	2.76	0.47	1584	5.70	2.68	0.47	1620	5.50	2.59	0.47	1691
24	22	6.38	2.23	0.35	1549	6.15	2.15	0.35	1647	6.00	2.10	0.35	1691	5.75	2.01	0.35	1762
24	24	6.70	1.54	0.23	1620	6.45	1.48	0.23	1709	6.30	1.45	0.23	1762	6.10	1.40	0.23	1851
25	18	5.88	3.70	0.63	1424	5.63	3.54	0.63	1495	5.40	3.40	0.63	1566	5.20	3.28	0.63	1638
25	20	6.13	3.12	0.51	1495	5.88	3.00	0.51	1584	5.70	2.91	0.51	1620	5.50	2.81	0.51	1691
25	22	6.38	2.49	0.39	1549	6.15	2.40	0.39	1647	6.00	2.34	0.39	1691	5.75	2.24	0.39	1762
25	24	6.70	1.81	0.27	1620	6.45	1.74	0.27	1709	6.30	1.70	0.27	1762	6.10	1.65	0.27	1851
26	18	5.88	3.94	0.67	1424	5.63	3.77	0.67	1495	5.40	3.62	0.67	1566	5.20	3.48	0.67	1638
26	20	6.13	3.37	0.55	1495	5.88	3.23	0.55	1584	5.70	3.14	0.55	1620	5.50	3.03	0.55	1691
26	22	6.38	2.74	0.43	1549	6.15	2.64	0.43	1647	6.00	2.58	0.43	1691	5.75	2.47	0.43	1762
26	24	6.70	2.08	0.31	1620	6.45	2.00	0.31	1709	6.30	1.95	0.31	1762	6.10	1.89	0.31	1851
26	26	6.90	1.31	0.19	1709	6.70	1.27	0.19	1798	6.60	1.25	0.19	1851	6.40	1.22	0.19	1905
27	18	5.88	4.17	0.71	1424	5.63	3.99	0.71	1495	5.40	3.83	0.71	1566	5.20	3.69	0.71	1638
27	20	6.13	3.61	0.59	1495	5.88	3.47	0.59	1584	5.70	3.36	0.59	1620	5.50	3.25	0.59	1691
27	22	6.38	3.00	0.47	1549	6.15	2.89	0.47	1647	6.00	2.82	0.47	1691	5.75	2.70	0.47	1762
27	24	6.70	2.35	0.35	1620	6.45	2.26	0.35	1709	6.30	2.21	0.35	1762	6.10	2.14	0.35	1851
27	26	6.90	1.59	0.23	1709	6.70	1.54	0.23	1798	6.60	1.52	0.23	1851	6.40	1.47	0.23	1905
28	18	5.88	4.41	0.75	1424	5.63	4.22	0.75	1495	5.40	4.05	0.75	1566	5.20	3.90	0.75	1638
28	20	6.13	3.86	0.63	1495	5.88	3.70	0.63	1584	5.70	3.59	0.63	1620	5.50	3.47	0.63	1691
28	22	6.38	3.25	0.51	1549	6.15	3.14	0.51	1647	6.00	3.06	0.51	1691	5.75	2.93	0.51	1762
28	24	6.70	2.61	0.39	1620	6.45	2.52	0.39	1709	6.30	2.46	0.39	1762	6.10	2.38	0.39	1851
28	26	6.90	1.86	0.27	1709	6.70	1.81	0.27	1798	6.60	1.78	0.27	1851	6.40	1.73	0.27	1905
29	18	5.88	4.64	0.79	1424	5.63	4.44	0.79	1495	5.40	4.27	0.79	1566	5.20	4.11	0.79	1638
29	20	6.13	4.10	0.67	1495	5.88	3.94	0.67	1584	5.70	3.82	0.67	1620	5.50	3.69	0.67	1691
29	22	6.38	3.51	0.55	1549	6.15	3.38	0.55	1647	6.00	3.30	0.55	1691	5.75	3.16	0.55	1762
29	24	6.70	2.88	0.43	1620	6.45	2.77	0.43	1709	6.30	2.71	0.43	1762	6.10	2.62	0.43	1851
29	26	6.90	2.14	0.31	1709	6.70	2.08	0.31	1798	6.60	2.05	0.31	1851	6.40	1.98	0.31	1905
30	18	5.88	4.88	0.83	1424	5.63	4.67	0.83	1495	5.40	4.48	0.83	1566	5.20	4.32	0.83	1638
30	20	6.13	4.35	0.71	1495	5.88	4.17	0.71	1584	5.70	4.05	0.71	1620	5.50	3.91	0.71	1691
30	22	6.38	3.76	0.59	1549	6.15	3.63	0.59	1647	6.00	3.54	0.59	1691	5.75	3.39	0.59	1762
30	24	6.70	3.15	0.47	1620	6.45	3.03	0.47	1709	6.30	2.96	0.47	1762	6.10	2.87	0.47	1851
30	26	6.90	2.42	0.35	1709	6.70	2.35	0.35	1798	6.60	2.31	0.35	1851	6.40	2.24	0.35	1905
31	18	5.88	5.11	0.87	1424	5.63	4.89	0.87	1495	5.40	4.70	0.87	1566	5.20	4.52	0.87	1638
31	20	6.13	4.59	0.75	1495	5.88	4.41	0.75	1584	5.70	4.28	0.75	1620	5.50	4.13	0.75	1691
31	22	6.38	4.02	0.63	1549	6.15	3.87	0.63	1647	6.00	3.78	0.63	1691	5.75	3.62	0.63	1762
31	24	6.70	3.42	0.51	1620	6.45	3.29	0.51	1709	6.30	3.21	0.51	1762	6.10	3.11	0.51	1851
31	26	6.90	2.69	0.39	1709	6.70	2.61	0.39	1798	6.60	2.57	0.39	1851	6.40	2.50	0.39	1905
32	18	5.88	5.35	0.91	1424	5.63	5.12	0.91	1495	5.40	4.91	0.91	1566	5.20	4.73	0.91	1638
32	20	6.13	4.84	0.79	1495	5.88	4.64	0.79	1584	5.70	4.50	0.79	1620	5.50	4.35	0.79	1691
32	22	6.38	4.27	0.67	1549	6.15	4.12	0.67	1647	6.00	4.02	0.67	1691	5.75	3.85	0.67	1762
32	24	6.70	3.69	0.55	1620	6.45	3.55	0.55	1709	6.30	3.47	0.55	1762	6.10	3.36	0.55	1851
32	26	6.90	2.97	0.43	1709	6.70	2.88	0.43	1798	6.60	2.84	0.43	1851	6.40	2.75	0.43	1905

NOTE Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature
SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

PERFORMANCE DATA COOL operation
MSH-GA50VB : MUH-GA50VB (230V)

CAPACITY : 5.0(kW) SHF : 0.65 INPUT : 1780(W)

		OUTDOOR DB(°C)											
INDOOR DB(°C)	INDOOR WB(°C)	35				40				43			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	4.90	2.30	0.47	1744	4.50	2.12	0.47	1851	4.33	2.03	0.47	1887
21	20	5.15	1.80	0.35	1816	4.80	1.68	0.35	1905	4.63	1.62	0.35	1958
22	18	4.90	2.50	0.51	1744	4.50	2.30	0.51	1851	4.33	2.21	0.51	1887
22	20	5.15	2.01	0.39	1816	4.80	1.87	0.39	1905	4.63	1.80	0.39	1958
22	22	5.45	1.47	0.27	1887	5.10	1.38	0.27	1994	4.93	1.33	0.27	2029
23	18	4.90	2.70	0.55	1744	4.50	2.48	0.55	1851	4.33	2.38	0.55	1887
23	20	5.15	2.21	0.43	1816	4.80	2.06	0.43	1905	4.63	1.99	0.43	1958
23	22	5.45	1.69	0.31	1887	5.10	1.58	0.31	1994	4.93	1.53	0.31	2029
24	18	4.90	2.89	0.59	1744	4.50	2.66	0.59	1851	4.33	2.55	0.59	1887
24	20	5.15	2.42	0.47	1816	4.80	2.26	0.47	1905	4.63	2.17	0.47	1958
24	22	5.45	1.91	0.35	1887	5.10	1.79	0.35	1994	4.93	1.72	0.35	2029
24	24	5.75	1.32	0.23	1958	5.40	1.24	0.23	2047	5.25	1.21	0.23	2092
25	18	4.90	3.09	0.63	1744	4.50	2.84	0.63	1851	4.33	2.72	0.63	1887
25	20	5.15	2.63	0.51	1816	4.80	2.45	0.51	1905	4.63	2.36	0.51	1958
25	22	5.45	2.13	0.39	1887	5.10	1.99	0.39	1994	4.93	1.92	0.39	2029
25	24	5.75	1.55	0.27	1958	5.40	1.46	0.27	2047	5.25	1.42	0.27	2092
26	18	4.90	3.28	0.67	1744	4.50	3.02	0.67	1851	4.33	2.90	0.67	1887
26	20	5.15	2.83	0.55	1816	4.80	2.64	0.55	1905	4.63	2.54	0.55	1958
26	22	5.45	2.34	0.43	1887	5.10	2.19	0.43	1994	4.93	2.12	0.43	2029
26	24	5.75	1.78	0.31	1958	5.40	1.67	0.31	2047	5.25	1.63	0.31	2092
26	26	6.05	1.15	0.19	2029	5.70	1.08	0.19	2118	5.53	1.05	0.19	2163
27	18	4.90	3.48	0.71	1744	4.50	3.20	0.71	1851	4.33	3.07	0.71	1887
27	20	5.15	3.04	0.59	1816	4.80	2.83	0.59	1905	4.63	2.73	0.59	1958
27	22	5.45	2.56	0.47	1887	5.10	2.40	0.47	1994	4.93	2.31	0.47	2029
27	24	5.75	2.01	0.35	1958	5.40	1.89	0.35	2047	5.25	1.84	0.35	2092
27	26	6.05	1.39	0.23	2029	5.70	1.31	0.23	2118	5.53	1.27	0.23	2163
28	18	4.90	3.68	0.75	1744	4.50	3.38	0.75	1851	4.33	3.24	0.75	1887
28	20	5.15	3.24	0.63	1816	4.80	3.02	0.63	1905	4.63	2.91	0.63	1958
28	22	5.45	2.78	0.51	1887	5.10	2.60	0.51	1994	4.93	2.51	0.51	2029
28	24	5.75	2.24	0.39	1958	5.40	2.11	0.39	2047	5.25	2.05	0.39	2092
28	26	6.05	1.63	0.27	2029	5.70	1.54	0.27	2118	5.53	1.49	0.27	2163
29	18	4.90	3.87	0.79	1744	4.50	3.56	0.79	1851	4.33	3.42	0.79	1887
29	20	5.15	3.45	0.67	1816	4.80	3.22	0.67	1905	4.63	3.10	0.67	1958
29	22	5.45	3.00	0.55	1887	5.10	2.81	0.55	1994	4.93	2.71	0.55	2029
29	24	5.75	2.47	0.43	1958	5.40	2.32	0.43	2047	5.25	2.26	0.43	2092
29	26	6.05	1.88	0.31	2029	5.70	1.77	0.31	2118	5.53	1.71	0.31	2163
30	18	4.90	4.07	0.83	1744	4.50	3.74	0.83	1851	4.33	3.59	0.83	1887
30	20	5.15	3.66	0.71	1816	4.80	3.41	0.71	1905	4.63	3.28	0.71	1958
30	22	5.45	3.22	0.59	1887	5.10	3.01	0.59	1994	4.93	2.91	0.59	2029
30	24	5.75	2.70	0.47	1958	5.40	2.54	0.47	2047	5.25	2.47	0.47	2092
30	26	6.05	2.12	0.35	2029	5.70	2.00	0.35	2118	5.53	1.93	0.35	2163
31	18	4.90	4.26	0.87	1744	4.50	3.92	0.87	1851	4.33	3.76	0.87	1887
31	20	5.15	3.86	0.75	1816	4.80	3.60	0.75	1905	4.63	3.47	0.75	1958
31	22	5.45	3.43	0.63	1887	5.10	3.21	0.63	1994	4.93	3.10	0.63	2029
31	24	5.75	2.93	0.51	1958	5.40	2.75	0.51	2047	5.25	2.68	0.51	2092
31	26	6.05	2.36	0.39	2029	5.70	2.22	0.39	2118	5.53	2.15	0.39	2163
32	18	4.90	4.46	0.91	1744	4.50	4.10	0.91	1851	4.33	3.94	0.91	1887
32	20	5.15	4.07	0.79	1816	4.80	3.79	0.79	1905	4.63	3.65	0.79	1958
32	22	5.45	3.65	0.67	1887	5.10	3.42	0.67	1994	4.93	3.30	0.67	2029
32	24	5.75	3.16	0.55	1958	5.40	2.97	0.55	2047	5.25	2.89	0.55	2092
32	26	6.05	2.60	0.43	2029	5.70	2.45	0.43	2118	5.53	2.38	0.43	2163

NOTE Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

PERFORMANCE DATA COOL operation

MSH-GA60VB : MUH-GA60VB (230V)

CAPACITY : 6.3(kW) SHF : 0.64 INPUT : 2410(W)

		OUTDOOR DB(°C)															
INDOOR DB(°C)	INDOOR WB(°C)	21				25				27				30			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	7.40	3.41	0.46	1928	7.09	3.26	0.46	2024	6.80	3.13	0.46	2121	6.55	3.01	0.46	2217
21	20	7.72	2.62	0.34	2024	7.40	2.52	0.34	2145	7.18	2.44	0.34	2193	6.93	2.36	0.34	2290
22	18	7.40	3.70	0.50	1928	7.09	3.54	0.50	2024	6.80	3.40	0.50	2121	6.55	3.28	0.50	2217
22	20	7.72	2.93	0.38	2024	7.40	2.81	0.38	2145	7.18	2.73	0.38	2193	6.93	2.63	0.38	2290
22	22	8.03	2.09	0.26	2097	7.75	2.01	0.26	2229	7.56	1.97	0.26	2290	7.25	1.88	0.26	2386
23	18	7.40	4.00	0.54	1928	7.09	3.83	0.54	2024	6.80	3.67	0.54	2121	6.55	3.54	0.54	2217
23	20	7.72	3.24	0.42	2024	7.40	3.11	0.42	2145	7.18	3.02	0.42	2193	6.93	2.91	0.42	2290
23	22	8.03	2.41	0.30	2097	7.75	2.32	0.30	2229	7.56	2.27	0.30	2290	7.25	2.17	0.30	2386
24	18	7.40	4.29	0.58	1928	7.09	4.11	0.58	2024	6.80	3.95	0.58	2121	6.55	3.80	0.58	2217
24	20	7.72	3.55	0.46	2024	7.40	3.41	0.46	2145	7.18	3.30	0.46	2193	6.93	3.19	0.46	2290
24	22	8.03	2.73	0.34	2097	7.75	2.63	0.34	2229	7.56	2.57	0.34	2290	7.25	2.46	0.34	2386
24	24	8.44	1.86	0.22	2193	8.13	1.79	0.22	2314	7.94	1.75	0.22	2386	7.69	1.69	0.22	2506
25	18	7.40	4.59	0.62	1928	7.09	4.39	0.62	2024	6.80	4.22	0.62	2121	6.55	4.06	0.62	2217
25	20	7.72	3.86	0.50	2024	7.40	3.70	0.50	2145	7.18	3.59	0.50	2193	6.93	3.47	0.50	2290
25	22	8.03	3.05	0.38	2097	7.75	2.94	0.38	2229	7.56	2.87	0.38	2290	7.25	2.75	0.38	2386
25	24	8.44	2.19	0.26	2193	8.13	2.11	0.26	2314	7.94	2.06	0.26	2386	7.69	2.00	0.26	2506
26	18	7.40	4.89	0.66	1928	7.09	4.68	0.66	2024	6.80	4.49	0.66	2121	6.55	4.32	0.66	2217
26	20	7.72	4.17	0.54	2024	7.40	4.00	0.54	2145	7.18	3.88	0.54	2193	6.93	3.74	0.54	2290
26	22	8.03	3.37	0.42	2097	7.75	3.25	0.42	2229	7.56	3.18	0.42	2290	7.25	3.04	0.42	2386
26	24	8.44	2.53	0.30	2193	8.13	2.44	0.30	2314	7.94	2.38	0.30	2386	7.69	2.31	0.30	2506
26	26	8.69	1.56	0.18	2314	8.44	1.52	0.18	2434	8.32	1.50	0.18	2506	8.06	1.45	0.18	2579
27	18	7.40	5.18	0.70	1928	7.09	4.96	0.70	2024	6.80	4.76	0.70	2121	6.55	4.59	0.70	2217
27	20	7.72	4.48	0.58	2024	7.40	4.29	0.58	2145	7.18	4.17	0.58	2193	6.93	4.02	0.58	2290
27	22	8.03	3.69	0.46	2097	7.75	3.56	0.46	2229	7.56	3.48	0.46	2290	7.25	3.33	0.46	2386
27	24	8.44	2.87	0.34	2193	8.13	2.76	0.34	2314	7.94	2.70	0.34	2386	7.69	2.61	0.34	2506
27	26	8.69	1.91	0.22	2314	8.44	1.86	0.22	2434	8.32	1.83	0.22	2506	8.06	1.77	0.22	2579
28	18	7.40	5.48	0.74	1928	7.09	5.24	0.74	2024	6.80	5.03	0.74	2121	6.55	4.85	0.74	2217
28	20	7.72	4.78	0.62	2024	7.40	4.59	0.62	2145	7.18	4.45	0.62	2193	6.93	4.30	0.62	2290
28	22	8.03	4.02	0.50	2097	7.75	3.87	0.50	2229	7.56	3.78	0.50	2290	7.25	3.62	0.50	2386
28	24	8.44	3.21	0.38	2193	8.13	3.09	0.38	2314	7.94	3.02	0.38	2386	7.69	2.92	0.38	2506
28	26	8.69	2.26	0.26	2314	8.44	2.19	0.26	2434	8.32	2.16	0.26	2506	8.06	2.10	0.26	2579
29	18	7.40	5.77	0.78	1928	7.09	5.53	0.78	2024	6.80	5.31	0.78	2121	6.55	5.11	0.78	2217
29	20	7.72	5.09	0.66	2024	7.40	4.89	0.66	2145	7.18	4.74	0.66	2193	6.93	4.57	0.66	2290
29	22	8.03	4.34	0.54	2097	7.75	4.18	0.54	2229	7.56	4.08	0.54	2290	7.25	3.91	0.54	2386
29	24	8.44	3.55	0.42	2193	8.13	3.41	0.42	2314	7.94	3.33	0.42	2386	7.69	3.23	0.42	2506
29	26	8.69	2.61	0.30	2314	8.44	2.53	0.30	2434	8.32	2.49	0.30	2506	8.06	2.42	0.30	2579
30	18	7.40	6.07	0.82	1928	7.09	5.81	0.82	2024	6.80	5.58	0.82	2121	6.55	5.37	0.82	2217
30	20	7.72	5.40	0.70	2024	7.40	5.18	0.70	2145	7.18	5.03	0.70	2193	6.93	4.85	0.70	2290
30	22	8.03	4.66	0.58	2097	7.75	4.49	0.58	2229	7.56	4.38	0.58	2290	7.25	4.20	0.58	2386
30	24	8.44	3.88	0.46	2193	8.13	3.74	0.46	2314	7.94	3.65	0.46	2386	7.69	3.54	0.46	2506
30	26	8.69	2.96	0.34	2314	8.44	2.87	0.34	2434	8.32	2.83	0.34	2506	8.06	2.74	0.34	2579
31	18	7.40	6.37	0.86	1928	7.09	6.10	0.86	2024	6.80	5.85	0.86	2121	6.55	5.63	0.86	2217
31	20	7.72	5.71	0.74	2024	7.40	5.48	0.74	2145	7.18	5.31	0.74	2193	6.93	5.13	0.74	2290
31	22	8.03	4.98	0.62	2097	7.75	4.80	0.62	2229	7.56	4.69	0.62	2290	7.25	4.49	0.62	2386
31	24	8.44	4.22	0.50	2193	8.13	4.06	0.50	2314	7.94	3.97	0.50	2386	7.69	3.84	0.50	2506
31	26	8.69	3.30	0.38	2314	8.44	3.21	0.38	2434	8.32	3.16	0.38	2506	8.06	3.06	0.38	2579
32	18	7.40	6.66	0.90	1928	7.09	6.38	0.90	2024	6.80	6.12	0.90	2121	6.55	5.90	0.90	2217
32	20	7.72	6.02	0.78	2024	7.40	5.77	0.78	2145	7.18	5.60	0.78	2193	6.93	5.41	0.78	2290
32	22	8.03	5.30	0.66	2097	7.75	5.11	0.66	2229	7.56	4.99	0.66	2290	7.25	4.78	0.66	2386
32	24	8.44	4.56	0.54	2193	8.13	4.39	0.54	2314	7.94	4.29	0.54	2386	7.69	4.15	0.54	2506
32	26	8.69	3.65	0.42	2314	8.44	3.55	0.42	2434	8.32	3.49	0.42	2506	8.06	3.39	0.42	2579

NOTE Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature
SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

PERFORMANCE DATA COOL operation
MSH-GA60VB : MUH-GA60VB (230V)

CAPACITY : 6.3(kW) SHF : 0.64 INPUT : 2410(W)

		OUTDOOR DB(°C)											
INDOOR DB(°C)	INDOOR WB(°C)	35				40				43			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	6.17	2.84	0.46	2362	5.67	2.61	0.46	2506	5.45	2.51	0.46	2555
21	20	6.49	2.21	0.34	2458	6.05	2.06	0.34	2579	5.83	1.98	0.34	2651
22	18	6.17	3.09	0.50	2362	5.67	2.84	0.50	2506	5.45	2.72	0.50	2555
22	20	6.49	2.47	0.38	2458	6.05	2.30	0.38	2579	5.83	2.21	0.38	2651
22	22	6.87	1.79	0.26	2555	6.43	1.67	0.26	2699	6.21	1.61	0.26	2747
23	18	6.17	3.33	0.54	2362	5.67	3.06	0.54	2506	5.45	2.94	0.54	2555
23	20	6.49	2.73	0.42	2458	6.05	2.54	0.42	2579	5.83	2.45	0.42	2651
23	22	6.87	2.06	0.30	2555	6.43	1.93	0.30	2699	6.21	1.86	0.30	2747
24	18	6.17	3.58	0.58	2362	5.67	3.29	0.58	2506	5.45	3.16	0.58	2555
24	20	6.49	2.98	0.46	2458	6.05	2.78	0.46	2579	5.83	2.68	0.46	2651
24	22	6.87	2.33	0.34	2555	6.43	2.18	0.34	2699	6.21	2.11	0.34	2747
24	24	7.25	1.59	0.22	2651	6.80	1.50	0.22	2772	6.62	1.46	0.22	2832
25	18	6.17	3.83	0.62	2362	5.67	3.52	0.62	2506	5.45	3.38	0.62	2555
25	20	6.49	3.24	0.50	2458	6.05	3.02	0.50	2579	5.83	2.91	0.50	2651
25	22	6.87	2.61	0.38	2555	6.43	2.44	0.38	2699	6.21	2.36	0.38	2747
25	24	7.25	1.88	0.26	2651	6.80	1.77	0.26	2772	6.62	1.72	0.26	2832
26	18	6.17	4.07	0.66	2362	5.67	3.74	0.66	2506	5.45	3.60	0.66	2555
26	20	6.49	3.50	0.54	2458	6.05	3.27	0.54	2579	5.83	3.15	0.54	2651
26	22	6.87	2.88	0.42	2555	6.43	2.70	0.42	2699	6.21	2.61	0.42	2747
26	24	7.25	2.17	0.30	2651	6.80	2.04	0.30	2772	6.62	1.98	0.30	2832
26	26	7.62	1.37	0.18	2747	7.18	1.29	0.18	2868	6.96	1.25	0.18	2928
27	18	6.17	4.32	0.70	2362	5.67	3.97	0.70	2506	5.45	3.81	0.70	2555
27	20	6.49	3.76	0.58	2458	6.05	3.51	0.58	2579	5.83	3.38	0.58	2651
27	22	6.87	3.16	0.46	2555	6.43	2.96	0.46	2699	6.21	2.85	0.46	2747
27	24	7.25	2.46	0.34	2651	6.80	2.31	0.34	2772	6.62	2.25	0.34	2832
27	26	7.62	1.68	0.22	2747	7.18	1.58	0.22	2868	6.96	1.53	0.22	2928
28	18	6.17	4.57	0.74	2362	5.67	4.20	0.74	2506	5.45	4.03	0.74	2555
28	20	6.49	4.02	0.62	2458	6.05	3.75	0.62	2579	5.83	3.61	0.62	2651
28	22	6.87	3.43	0.50	2555	6.43	3.21	0.50	2699	6.21	3.10	0.50	2747
28	24	7.25	2.75	0.38	2651	6.80	2.59	0.38	2772	6.62	2.51	0.38	2832
28	26	7.62	1.98	0.26	2747	7.18	1.87	0.26	2868	6.96	1.81	0.26	2928
29	18	6.17	4.82	0.78	2362	5.67	4.42	0.78	2506	5.45	4.25	0.78	2555
29	20	6.49	4.28	0.66	2458	6.05	3.99	0.66	2579	5.83	3.85	0.66	2651
29	22	6.87	3.71	0.54	2555	6.43	3.47	0.54	2699	6.21	3.35	0.54	2747
29	24	7.25	3.04	0.42	2651	6.80	2.86	0.42	2772	6.62	2.78	0.42	2832
29	26	7.62	2.29	0.30	2747	7.18	2.15	0.30	2868	6.96	2.09	0.30	2928
30	18	6.17	5.06	0.82	2362	5.67	4.65	0.82	2506	5.45	4.47	0.82	2555
30	20	6.49	4.54	0.70	2458	6.05	4.23	0.70	2579	5.83	4.08	0.70	2651
30	22	6.87	3.98	0.58	2555	6.43	3.73	0.58	2699	6.21	3.60	0.58	2747
30	24	7.25	3.33	0.46	2651	6.80	3.13	0.46	2772	6.62	3.04	0.46	2832
30	26	7.62	2.59	0.34	2747	7.18	2.44	0.34	2868	6.96	2.37	0.34	2928
31	18	6.17	5.31	0.86	2362	5.67	4.88	0.86	2506	5.45	4.69	0.86	2555
31	20	6.49	4.80	0.74	2458	6.05	4.48	0.74	2579	5.83	4.31	0.74	2651
31	22	6.87	4.26	0.62	2555	6.43	3.98	0.62	2699	6.21	3.85	0.62	2747
31	24	7.25	3.62	0.50	2651	6.80	3.40	0.50	2772	6.62	3.31	0.50	2832
31	26	7.62	2.90	0.38	2747	7.18	2.73	0.38	2868	6.96	2.65	0.38	2928
32	18	6.17	5.56	0.90	2362	5.67	5.10	0.90	2506	5.45	4.90	0.90	2555
32	20	6.49	5.06	0.78	2458	6.05	4.72	0.78	2579	5.83	4.55	0.78	2651
32	22	6.87	4.53	0.66	2555	6.43	4.24	0.66	2699	6.21	4.10	0.66	2747
32	24	7.25	3.91	0.54	2651	6.80	3.67	0.54	2772	6.62	3.57	0.54	2832
32	26	7.62	3.20	0.42	2747	7.18	3.02	0.42	2868	6.96	2.92	0.42	2928

NOTE Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

PERFORMANCE DATA COOL operation

MSH-GA80VB : MUH-GA80VB (230V)

CAPACITY : 8.5(kW) SHF : 0.62 INPUT : 3260(W)

		OUTDOOR DB(°C)															
INDOOR DB(°C)	INDOOR WB(°C)	21				25				27				30			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	9.99	4.39	0.44	2608	9.56	4.21	0.44	2738	9.18	4.04	0.44	2869	8.84	3.89	0.44	2999
21	20	10.41	3.33	0.32	2738	9.99	3.20	0.32	2901	9.69	3.10	0.32	2967	9.35	2.99	0.32	3097
22	18	9.99	4.79	0.48	2608	9.56	4.59	0.48	2738	9.18	4.41	0.48	2869	8.84	4.24	0.48	2999
22	20	10.41	3.75	0.36	2738	9.99	3.60	0.36	2901	9.69	3.49	0.36	2967	9.35	3.37	0.36	3097
22	22	10.84	2.60	0.24	2836	10.46	2.51	0.24	3016	10.20	2.45	0.24	3097	9.78	2.35	0.24	3227
23	18	9.99	5.19	0.52	2608	9.56	4.97	0.52	2738	9.18	4.77	0.52	2869	8.84	4.60	0.52	2999
23	20	10.41	4.17	0.40	2738	9.99	4.00	0.40	2901	9.69	3.88	0.40	2967	9.35	3.74	0.40	3097
23	22	10.84	3.03	0.28	2836	10.46	2.93	0.28	3016	10.20	2.86	0.28	3097	9.78	2.74	0.28	3227
24	18	9.99	5.59	0.56	2608	9.56	5.36	0.56	2738	9.18	5.14	0.56	2869	8.84	4.95	0.56	2999
24	20	10.41	4.58	0.44	2738	9.99	4.39	0.44	2901	9.69	4.26	0.44	2967	9.35	4.11	0.44	3097
24	22	10.84	3.47	0.32	2836	10.46	3.35	0.32	3016	10.20	3.26	0.32	3097	9.78	3.13	0.32	3227
24	24	11.39	2.28	0.20	2967	10.97	2.19	0.20	3130	10.71	2.14	0.20	3227	10.37	2.07	0.20	3390
25	18	9.99	5.99	0.60	2608	9.56	5.74	0.60	2738	9.18	5.51	0.60	2869	8.84	5.30	0.60	2999
25	20	10.41	5.00	0.48	2738	9.99	4.79	0.48	2901	9.69	4.65	0.48	2967	9.35	4.49	0.48	3097
25	22	10.84	3.90	0.36	2836	10.46	3.76	0.36	3016	10.20	3.67	0.36	3097	9.78	3.52	0.36	3227
25	24	11.39	2.73	0.24	2967	10.97	2.63	0.24	3130	10.71	2.57	0.24	3227	10.37	2.49	0.24	3390
26	18	9.99	6.39	0.64	2608	9.56	6.12	0.64	2738	9.18	5.88	0.64	2869	8.84	5.66	0.64	2999
26	20	10.41	5.41	0.52	2738	9.99	5.19	0.52	2901	9.69	5.04	0.52	2967	9.35	4.86	0.52	3097
26	22	10.84	4.34	0.40	2836	10.46	4.18	0.40	3016	10.20	4.08	0.40	3097	9.78	3.91	0.40	3227
26	24	11.39	3.19	0.28	2967	10.97	3.07	0.28	3130	10.71	3.00	0.28	3227	10.37	2.90	0.28	3390
26	26	11.73	1.88	0.16	3130	11.39	1.82	0.16	3293	11.22	1.80	0.16	3390	10.88	1.74	0.16	3488
27	18	9.99	6.79	0.68	2608	9.56	6.50	0.68	2738	9.18	6.24	0.68	2869	8.84	6.01	0.68	2999
27	20	10.41	5.83	0.56	2738	9.99	5.59	0.56	2901	9.69	5.43	0.56	2967	9.35	5.24	0.56	3097
27	22	10.84	4.77	0.44	2836	10.46	4.60	0.44	3016	10.20	4.49	0.44	3097	9.78	4.30	0.44	3227
27	24	11.39	3.64	0.32	2967	10.97	3.51	0.32	3130	10.71	3.43	0.32	3227	10.37	3.32	0.32	3390
27	26	11.73	2.35	0.20	3130	11.39	2.28	0.20	3293	11.22	2.24	0.20	3390	10.88	2.18	0.20	3488
28	18	9.99	7.19	0.72	2608	9.56	6.89	0.72	2738	9.18	6.61	0.72	2869	8.84	6.36	0.72	2999
28	20	10.41	6.25	0.60	2738	9.99	5.99	0.60	2901	9.69	5.81	0.60	2967	9.35	5.61	0.60	3097
28	22	10.84	5.20	0.48	2836	10.46	5.02	0.48	3016	10.20	4.90	0.48	3097	9.78	4.69	0.48	3227
28	24	11.39	4.10	0.36	2967	10.97	3.95	0.36	3130	10.71	3.86	0.36	3227	10.37	3.73	0.36	3390
28	26	11.73	2.82	0.24	3130	11.39	2.73	0.24	3293	11.22	2.69	0.24	3390	10.88	2.61	0.24	3488
29	18	9.99	7.59	0.76	2608	9.56	7.27	0.76	2738	9.18	6.98	0.76	2869	8.84	6.72	0.76	2999
29	20	10.41	6.66	0.64	2738	9.99	6.39	0.64	2901	9.69	6.20	0.64	2967	9.35	5.98	0.64	3097
29	22	10.84	5.64	0.52	2836	10.46	5.44	0.52	3016	10.20	5.30	0.52	3097	9.78	5.08	0.52	3227
29	24	11.39	4.56	0.40	2967	10.97	4.39	0.40	3130	10.71	4.28	0.40	3227	10.37	4.15	0.40	3390
29	26	11.73	3.28	0.28	3130	11.39	3.19	0.28	3293	11.22	3.14	0.28	3390	10.88	3.05	0.28	3488
30	18	9.99	7.99	0.80	2608	9.56	7.65	0.80	2738	9.18	7.34	0.80	2869	8.84	7.07	0.80	2999
30	20	10.41	7.08	0.68	2738	9.99	6.79	0.68	2901	9.69	6.59	0.68	2967	9.35	6.36	0.68	3097
30	22	10.84	6.07	0.56	2836	10.46	5.85	0.56	3016	10.20	5.71	0.56	3097	9.78	5.47	0.56	3227
30	24	11.39	5.01	0.44	2967	10.97	4.82	0.44	3130	10.71	4.71	0.44	3227	10.37	4.56	0.44	3390
30	26	11.73	3.75	0.32	3130	11.39	3.64	0.32	3293	11.22	3.59	0.32	3390	10.88	3.48	0.32	3488
31	18	9.99	8.39	0.84	2608	9.56	8.03	0.84	2738	9.18	7.71	0.84	2869	8.84	7.43	0.84	2999
31	20	10.41	7.50	0.72	2738	9.99	7.19	0.72	2901	9.69	6.98	0.72	2967	9.35	6.73	0.72	3097
31	22	10.84	6.50	0.60	2836	10.46	6.27	0.60	3016	10.20	6.12	0.60	3097	9.78	5.87	0.60	3227
31	24	11.39	5.47	0.48	2967	10.97	5.26	0.48	3130	10.71	5.14	0.48	3227	10.37	4.98	0.48	3390
31	26	11.73	4.22	0.36	3130	11.39	4.10	0.36	3293	11.22	4.04	0.36	3390	10.88	3.92	0.36	3488
32	18	9.99	8.79	0.88	2608	9.56	8.42	0.88	2738	9.18	8.08	0.88	2869	8.84	7.78	0.88	2999
32	20	10.41	7.91	0.76	2738	9.99	7.59	0.76	2901	9.69	7.36	0.76	2967	9.35	7.11	0.76	3097
32	22	10.84	6.94	0.64	2836	10.46	6.69	0.64	3016	10.20	6.53	0.64	3097	9.78	6.26	0.64	3227
32	24	11.39	5.92	0.52	2967	10.97	5.70	0.52	3130	10.71	5.57	0.52	3227	10.37	5.39	0.52	3390
32	26	11.73	4.69	0.40	3130	11.39	4.56	0.40	3293	11.22	4.49	0.40	3390	10.88	4.35	0.40	3488

NOTE Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature
SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

PERFORMANCE DATA COOL operation
MSH-GA80VB : MUH-GA80VB (230V)

CAPACITY : 8.5(kW) SHF : 0.62 INPUT : 3260(W)

		OUTDOOR DB(°C)											
INDOOR DB(°C)	INDOOR WB(°C)	35				40				43			
		Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT	Q	SHC	SHF	INPUT
21	18	8.33	3.67	0.44	3195	7.65	3.37	0.44	3390	7.35	3.24	0.44	3456
21	20	8.76	2.80	0.32	3325	8.16	2.61	0.32	3488	7.86	2.52	0.32	3586
22	18	8.33	4.00	0.48	3195	7.65	3.67	0.48	3390	7.35	3.53	0.48	3456
22	20	8.76	3.15	0.36	3325	8.16	2.94	0.36	3488	7.86	2.83	0.36	3586
22	22	9.27	2.22	0.24	3456	8.67	2.08	0.24	3651	8.37	2.01	0.24	3716
23	18	8.33	4.33	0.52	3195	7.65	3.98	0.52	3390	7.35	3.82	0.52	3456
23	20	8.76	3.50	0.40	3325	8.16	3.26	0.40	3488	7.86	3.15	0.40	3586
23	22	9.27	2.59	0.28	3456	8.67	2.43	0.28	3651	8.37	2.34	0.28	3716
24	18	8.33	4.66	0.56	3195	7.65	4.28	0.56	3390	7.35	4.12	0.56	3456
24	20	8.76	3.85	0.44	3325	8.16	3.59	0.44	3488	7.86	3.46	0.44	3586
24	22	9.27	2.96	0.32	3456	8.67	2.77	0.32	3651	8.37	2.68	0.32	3716
24	24	9.78	1.96	0.20	3586	9.18	1.84	0.20	3749	8.93	1.79	0.20	3831
25	18	8.33	5.00	0.60	3195	7.65	4.59	0.60	3390	7.35	4.41	0.60	3456
25	20	8.76	4.20	0.48	3325	8.16	3.92	0.48	3488	7.86	3.77	0.48	3586
25	22	9.27	3.34	0.36	3456	8.67	3.12	0.36	3651	8.37	3.01	0.36	3716
25	24	9.78	2.35	0.24	3586	9.18	2.20	0.24	3749	8.93	2.14	0.24	3831
26	18	8.33	5.33	0.64	3195	7.65	4.90	0.64	3390	7.35	4.71	0.64	3456
26	20	8.76	4.55	0.52	3325	8.16	4.24	0.52	3488	7.86	4.09	0.52	3586
26	22	9.27	3.71	0.40	3456	8.67	3.47	0.40	3651	8.37	3.35	0.40	3716
26	24	9.78	2.74	0.28	3586	9.18	2.57	0.28	3749	8.93	2.50	0.28	3831
26	26	10.29	1.65	0.16	3716	9.69	1.55	0.16	3879	9.39	1.50	0.16	3961
27	18	8.33	5.66	0.68	3195	7.65	5.20	0.68	3390	7.35	5.00	0.68	3456
27	20	8.76	4.90	0.56	3325	8.16	4.57	0.56	3488	7.86	4.40	0.56	3586
27	22	9.27	4.08	0.44	3456	8.67	3.81	0.44	3651	8.37	3.68	0.44	3716
27	24	9.78	3.13	0.32	3586	9.18	2.94	0.32	3749	8.93	2.86	0.32	3831
27	26	10.29	2.06	0.20	3716	9.69	1.94	0.20	3879	9.39	1.88	0.20	3961
28	18	8.33	6.00	0.72	3195	7.65	5.51	0.72	3390	7.35	5.29	0.72	3456
28	20	8.76	5.25	0.60	3325	8.16	4.90	0.60	3488	7.86	4.72	0.60	3586
28	22	9.27	4.45	0.48	3456	8.67	4.16	0.48	3651	8.37	4.02	0.48	3716
28	24	9.78	3.52	0.36	3586	9.18	3.30	0.36	3749	8.93	3.21	0.36	3831
28	26	10.29	2.47	0.24	3716	9.69	2.33	0.24	3879	9.39	2.25	0.24	3961
29	18	8.33	6.33	0.76	3195	7.65	5.81	0.76	3390	7.35	5.59	0.76	3456
29	20	8.76	5.60	0.64	3325	8.16	5.22	0.64	3488	7.86	5.03	0.64	3586
29	22	9.27	4.82	0.52	3456	8.67	4.51	0.52	3651	8.37	4.35	0.52	3716
29	24	9.78	3.91	0.40	3586	9.18	3.67	0.40	3749	8.93	3.57	0.40	3831
29	26	10.29	2.88	0.28	3716	9.69	2.71	0.28	3879	9.39	2.63	0.28	3961
30	18	8.33	6.66	0.80	3195	7.65	6.12	0.80	3390	7.35	5.88	0.80	3456
30	20	8.76	5.95	0.68	3325	8.16	5.55	0.68	3488	7.86	5.35	0.68	3586
30	22	9.27	5.19	0.56	3456	8.67	4.86	0.56	3651	8.37	4.69	0.56	3716
30	24	9.78	4.30	0.44	3586	9.18	4.04	0.44	3749	8.93	3.93	0.44	3831
30	26	10.29	3.29	0.32	3716	9.69	3.10	0.32	3879	9.39	3.01	0.32	3961
31	18	8.33	7.00	0.84	3195	7.65	6.43	0.84	3390	7.35	6.18	0.84	3456
31	20	8.76	6.30	0.72	3325	8.16	5.88	0.72	3488	7.86	5.66	0.72	3586
31	22	9.27	5.56	0.60	3456	8.67	5.20	0.60	3651	8.37	5.02	0.60	3716
31	24	9.78	4.69	0.48	3586	9.18	4.41	0.48	3749	8.93	4.28	0.48	3831
31	26	10.29	3.70	0.36	3716	9.69	3.49	0.36	3879	9.39	3.38	0.36	3961
32	18	8.33	7.33	0.88	3195	7.65	6.73	0.88	3390	7.35	6.47	0.88	3456
32	20	8.76	6.65	0.76	3325	8.16	6.20	0.76	3488	7.86	5.98	0.76	3586
32	22	9.27	5.93	0.64	3456	8.67	5.55	0.64	3651	8.37	5.36	0.64	3716
32	24	9.78	5.08	0.52	3586	9.18	4.77	0.52	3749	8.93	4.64	0.52	3831
32	26	10.29	4.11	0.40	3716	9.69	3.88	0.40	3879	9.39	3.76	0.40	3961

NOTE Q : Total capacity (kW) SHF : Sensible heat factor DB : Dry-bulb temperature
 SHC : Sensible heat capacity (kW) INPUT : Total power input (W) WB : Wet-bulb temperature

PERFORMANCE DATA HEAT operation

MSH-GA50VB : MUH-GA50VB (230V)

CAPACITY : 5.2(kW) INPUT : 1610(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	3.28	1047	3.95	1256	4.63	1417	5.30	1530	5.98	1626	6.60	1674	7.28	1707
21	3.12	1127	3.74	1336	4.42	1481	5.04	1594	5.72	1674	6.34	1723	6.99	1787
26	2.81	1208	3.48	1417	4.11	1562	4.78	1674	5.46	1755	6.08	1803	6.76	1852

NOTE Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

MSH-GA60VB : MUH-GA60VB (230V)

CAPACITY : 7.2(kW) INPUT : 2480(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	4.54	1612	5.47	1934	6.41	2182	7.34	2356	8.28	2505	9.14	2579	10.08	2629
21	4.32	1736	5.18	2058	6.12	2282	6.98	2455	7.92	2579	8.78	2654	9.68	2753
26	3.89	1860	4.82	2182	5.69	2406	6.62	2579	7.56	2703	8.42	2778	9.36	2852

NOTE Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

MSH-GA80VB : MUH-GA80VB (230V)

CAPACITY : 9.4(kW) INPUT : 3430(W)

INDOOR DB(°C)	OUTDOOR WB(°C)													
	-10		-5		0		5		10		15		20	
	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT	Q	INPUT
15	5.92	2230	7.14	2675	8.37	3018	9.59	3259	10.81	3464	11.94	3567	13.16	3636
21	5.64	2401	6.77	2847	7.99	3156	9.12	3396	10.34	3567	11.47	3670	12.64	3807
26	5.08	2573	6.30	3018	7.43	3327	8.65	3567	9.87	3739	11.00	3842	12.22	3945

NOTE Q :Total capacity (kW) INPUT:Total power input (W) DB : Dry-bulb temperature

MUH-GA50VB MUH-GA60VB MUH-GA80VB**9-1. COMPULSORY DEFROSTING MODE FOR SERVICE**

By short circuit of the connector JPDS and JPSG(MUH-GA50VB)/JPG1 and R871(MUH-GA60/GA80VB) on the outdoor deicer P.C. board, defrosting mode can be accomplished regardless of the defrost interval restriction. (Refer to 10-5.)

Defrost thermistor RT61 must read below -3°C.

9-2. CHANGE IN DEFROST SETTING

<JRF> When the JRF wire of the deicer P.C. board is cut, the defrost interval time will be changed.

<JRG> When the JRG wire of the deicer P.C. board is cut, the defrost temperature will be changed.
(Refer to 10-5.)

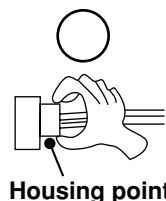
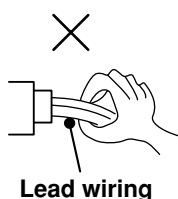
Model	Jumper wire	Change point
MUH-GA50VB MUH-GA60VB MUH-GA80VB	JRF	Defrost interval time changes from 40 minutes to 15 minutes.
	JRG	Defrost start temperature changes from -3°C to 0°C. (MUH-GA50VB) Defrost start temperature does not change. (-3.0°C) (MUH-GA60/GA80VB) Defrost finish temperature changes from 3°C to 10°C. (MUH-GA50VB) Defrost finish temperature changes from 3°C to 15°C. (MUH-GA60VB) Defrost finish temperature changes from 13°C to 15°C. (MUH-GA80VB)

MUH-GA50VB MUH-GA60VB MUH-GA80VB**10-1. CAUTIONS ON TROUBLESHOOTING****1. Before troubleshooting, check the following:**

- (1) Check the power supply voltage.
- (2) Check the indoor/outdoor connecting wire for mis-wiring.

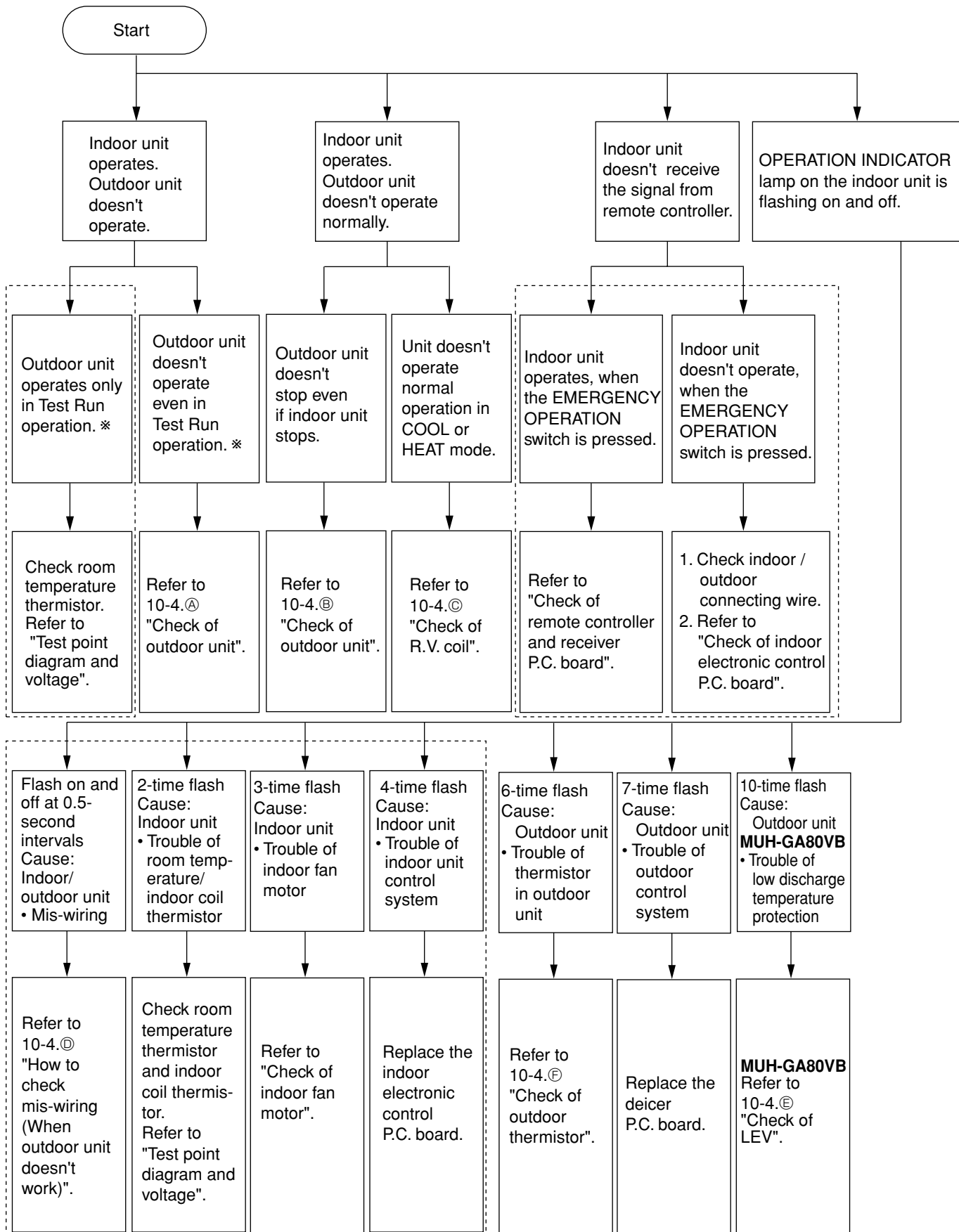
2. Take care the following during servicing.

- (1) Before servicing the air conditioner, be sure to turn OFF the main unit first with the remote controller, and then after confirming the horizontal vane is closed, turn OFF the breaker and / or disconnect the power plug.
- (2) Be sure to turn OFF the power supply before removing the front panel, the cabinet, the top panel, and the electronic control P.C. board.
- (3) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.
- (4) When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.

**3. Troubleshooting procedure**

- (1) First, check if the OPERATION INDICATOR lamp on the indoor unit is flashing on and off to indicate an abnormality.
To make sure, check how many times the abnormality indication is flashing on and off before starting service work.
- (2) Before servicing check that the connector and terminal are connected properly.
- (3) If the electronic control P.C. board is supposed to be defective, check the copper foil pattern for disconnection and the components for bursting and discolouration.
- (4) When troubleshooting, refer to 10-2.

10-2. INSTRUCTION OF TROUBLESHOOTING



Refer to indoor unit service manual.

※"Test Run operation" means the operation within 30 minutes after EMERGENCY OPERATION switch is pressed.

10-3. TROUBLE CRITERION OF MAIN PARTS

MUH-GA50VB MUH-GA60VB MUH-GA80VB

Part name	Check method and criterion	Figure																														
Defrost thermistor (RT61)	Measure the resistance with a tester. (Part temperature −10°C ~ 40°C) Refer to 10-5. "Test point diagram and voltage", "Outdoor deicer P.C. board", the chart of thermistor.																															
Discharge temperature thermistor(RT62) MUH-GA80VB	Measure the resistance with a tester. Before measurement, hold the thermistor with your hands to warm it up. (Part temperature 0°C ~ 40°C) Refer to 10-5. "Test point diagram and voltage", "Outdoor deicer P.C. board", the chart of thermistor.																															
Ambient temperature thermistor(RT63) MUH-GA80VB	Measure the resistance with a tester. (Part temperature −10°C ~ 40°C) Refer to 10-5. "Test point diagram and voltage", "Outdoor deicer P.C. board", the chart of thermistor.																															
Compressor (MC) INNER PROTECTOR 160± 5°C OPEN 90±10°C CLOSE	Measure the resistance between the terminals with a tester. (Part temperature −10°C ~ 40°C) <table><tr><th>Terminal</th><th colspan="3">Normal</th></tr><tr><td></td><td>MUH-GA50VB</td><td>MUH-GA60VB</td><td>MUH-GA80VB</td></tr><tr><td>C – R</td><td>1.59 Ω ~ 1.95 Ω</td><td>0.71 Ω ~ 0.87 Ω</td><td>0.56 Ω ~ 0.71 Ω</td></tr><tr><td>C – S</td><td>2.65 Ω ~ 3.24 Ω</td><td>1.45 Ω ~ 1.77 Ω</td><td>1.43 Ω ~ 1.76 Ω</td></tr></table>	Terminal	Normal				MUH-GA50VB	MUH-GA60VB	MUH-GA80VB	C – R	1.59 Ω ~ 1.95 Ω	0.71 Ω ~ 0.87 Ω	0.56 Ω ~ 0.71 Ω	C – S	2.65 Ω ~ 3.24 Ω	1.45 Ω ~ 1.77 Ω	1.43 Ω ~ 1.76 Ω															
Terminal	Normal																															
	MUH-GA50VB	MUH-GA60VB	MUH-GA80VB																													
C – R	1.59 Ω ~ 1.95 Ω	0.71 Ω ~ 0.87 Ω	0.56 Ω ~ 0.71 Ω																													
C – S	2.65 Ω ~ 3.24 Ω	1.45 Ω ~ 1.77 Ω	1.43 Ω ~ 1.76 Ω																													
Outdoor fan motor(MF) MUH-GA50VB MUH-GA60VB INNER PROTECTOR 130± 5°C OPEN (83±15°C CLOSE*) MUH-GA80VB INNER PROTECTOR 135± 5°C OPEN (83±15°C CLOSE*)	Measure the resistance between the terminals with a tester. (Part temperature −10°C ~ 40°C) <table><tr><th>Color of lead wire</th><th colspan="4">Normal</th></tr><tr><td></td><td>MUH-GA50VB-</td><td>MUH-GA50VB-</td><td>MUH-GA60VB</td><td>MUH-GA80VB</td></tr><tr><td>WHT – BLK</td><td>70.4 Ω ~ 85.5 Ω</td><td>63.1 Ω ~ 76.6 Ω</td><td>61.0 Ω ~ 74.0 Ω</td><td>55.4 Ω ~ 67.7 Ω</td></tr><tr><td>BLK – RED</td><td>73.6 Ω ~ 89.3 Ω</td><td>79.1 Ω ~ 96.1 Ω</td><td>82.5 Ω ~ 100.2 Ω</td><td>—</td></tr><tr><td>BLK – YLW</td><td>—</td><td>—</td><td>—</td><td>49.3 Ω ~ 60.3 Ω</td></tr><tr><td>YLW – RED</td><td>—</td><td>—</td><td>—</td><td>22.9 Ω ~ 28.0 Ω</td></tr></table>	Color of lead wire	Normal					MUH-GA50VB-	MUH-GA50VB-	MUH-GA60VB	MUH-GA80VB	WHT – BLK	70.4 Ω ~ 85.5 Ω	63.1 Ω ~ 76.6 Ω	61.0 Ω ~ 74.0 Ω	55.4 Ω ~ 67.7 Ω	BLK – RED	73.6 Ω ~ 89.3 Ω	79.1 Ω ~ 96.1 Ω	82.5 Ω ~ 100.2 Ω	—	BLK – YLW	—	—	—	49.3 Ω ~ 60.3 Ω	YLW – RED	—	—	—	22.9 Ω ~ 28.0 Ω	<p>MUH-GA50VB MUH-GA60VB</p> <p>MUH-GA80VB</p>
Color of lead wire	Normal																															
	MUH-GA50VB-	MUH-GA50VB-	MUH-GA60VB	MUH-GA80VB																												
WHT – BLK	70.4 Ω ~ 85.5 Ω	63.1 Ω ~ 76.6 Ω	61.0 Ω ~ 74.0 Ω	55.4 Ω ~ 67.7 Ω																												
BLK – RED	73.6 Ω ~ 89.3 Ω	79.1 Ω ~ 96.1 Ω	82.5 Ω ~ 100.2 Ω	—																												
BLK – YLW	—	—	—	49.3 Ω ~ 60.3 Ω																												
YLW – RED	—	—	—	22.9 Ω ~ 28.0 Ω																												
R.V. coil(21S4)	Measure the resistance between the terminals with a tester. (Part temperature −10°C ~ 40°C) <table><tr><th>Normal</th></tr><tr><td>2.673 kΩ ~ 3.268 kΩ</td></tr></table>	Normal	2.673 kΩ ~ 3.268 kΩ																													
Normal																																
2.673 kΩ ~ 3.268 kΩ																																
LEV(Expansion valve) MUH-GA80VB	Measure the resistance with a tester. (Part temperature : −10°C ~ 40°C) <table><tr><th>Color of lead wire</th><th>Normal</th></tr><tr><td>WHT – RED</td><td rowspan="4">41.0 Ω ~ 49.0 Ω</td></tr><tr><td>RED – ORN</td></tr><tr><td>YLW – BRN</td></tr><tr><td>BRN – BLU</td></tr></table>	Color of lead wire	Normal	WHT – RED	41.0 Ω ~ 49.0 Ω	RED – ORN	YLW – BRN	BRN – BLU																								
Color of lead wire	Normal																															
WHT – RED	41.0 Ω ~ 49.0 Ω																															
RED – ORN																																
YLW – BRN																																
BRN – BLU																																

* Reference value

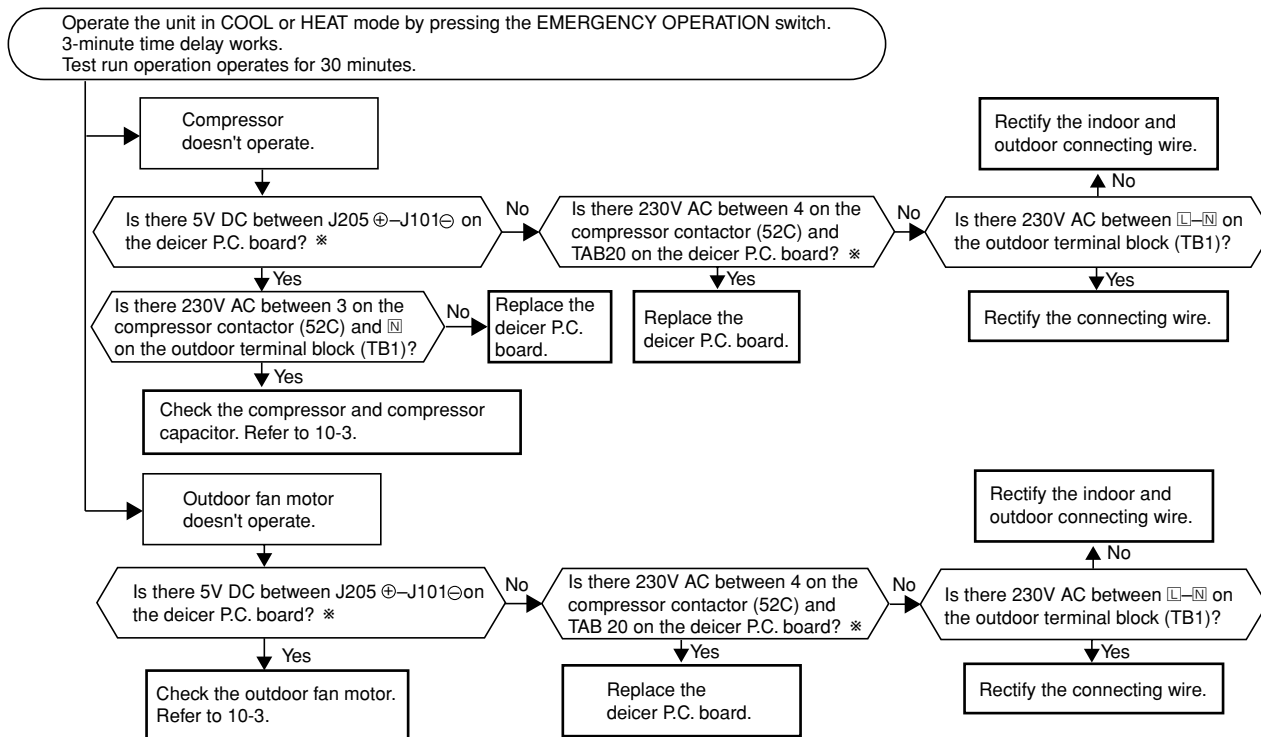
: INNER PROTECTOR

10-4. TROUBLESHOOTING FLOW

Compressor and/or outdoor fan motor doesn't operate.

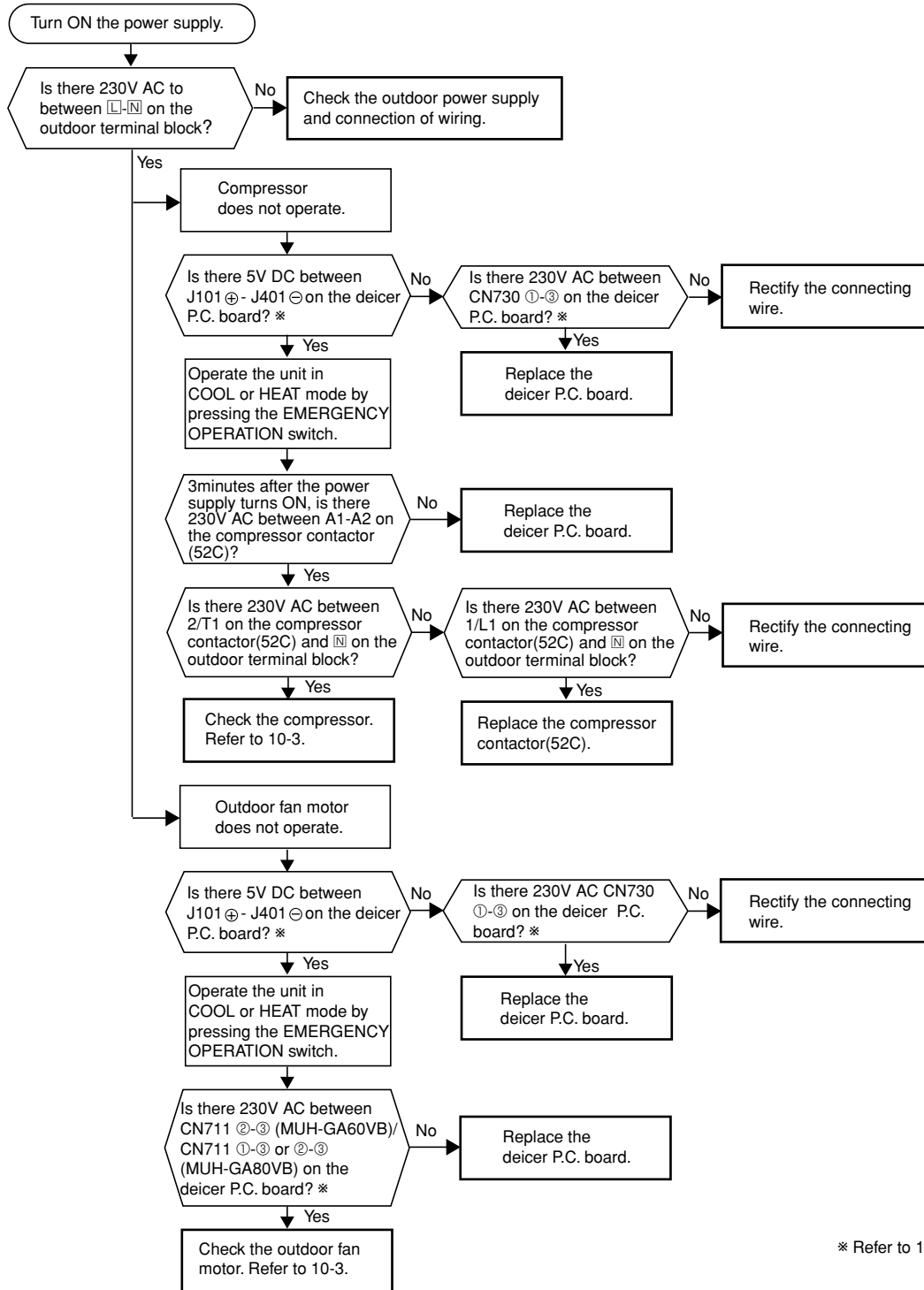
Ⓐ Check of outdoor unit

MUH-GA50VB



* Refer to 10-5.

**MUH-GA60VB
MUH-GA80VB**

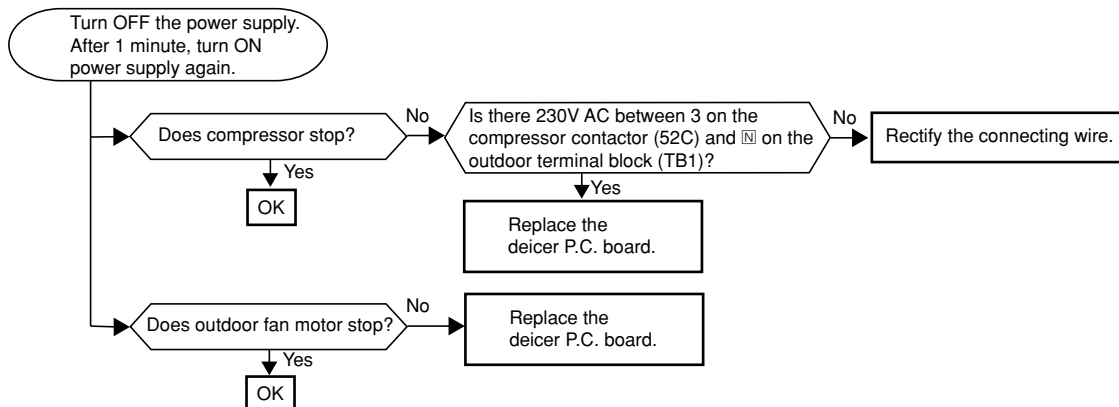


* Refer to 10-5.

Compressor and/or outdoor fan motor doesn't stop.

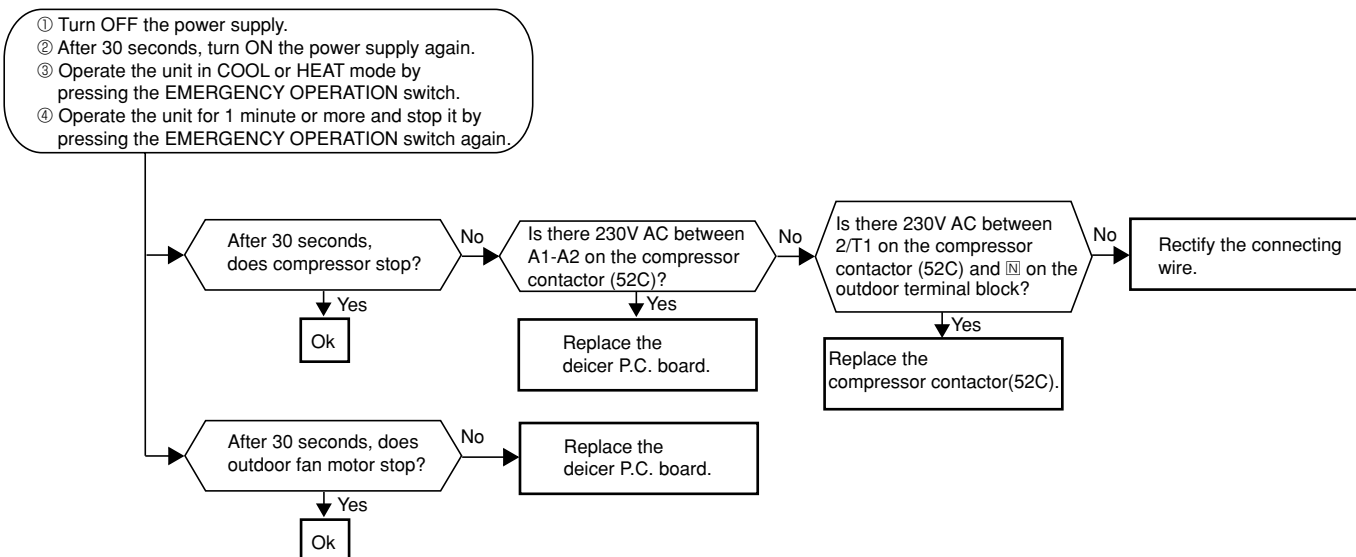
Ⓑ Check of outdoor unit

MUH-GA50VB



MUH-GA60VB

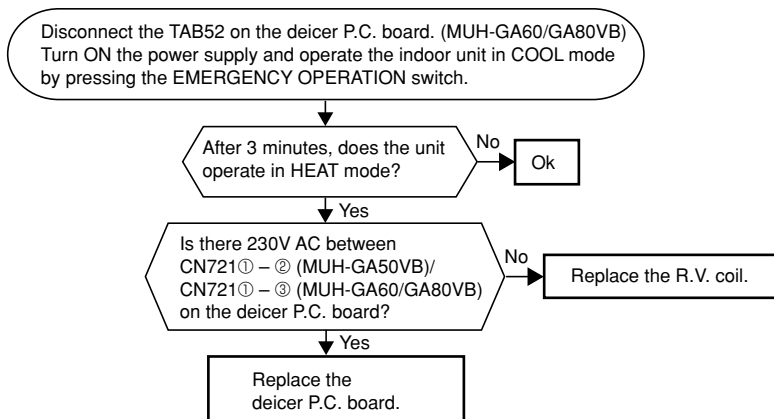
MUH-GA80VB



Unit operates HEAT mode even if it is set to COOL mode.

Ⓒ Check of R.V. coil

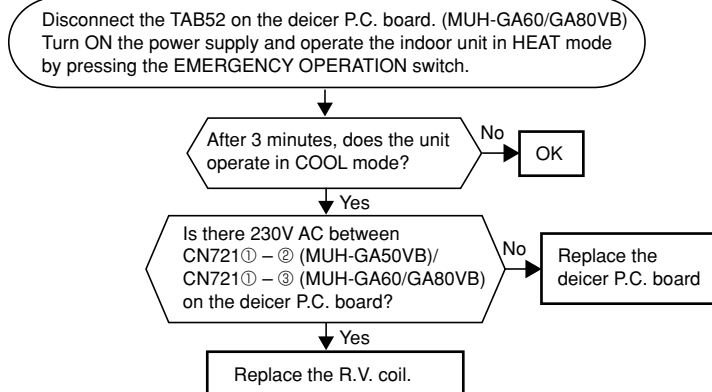
※ First, measure the resistance of R.V. coil to confirm it is disconnected or is not short-circuit.



Unit operates COOL mode even if it is set to HEAT mode.

© Check of R.V. coil

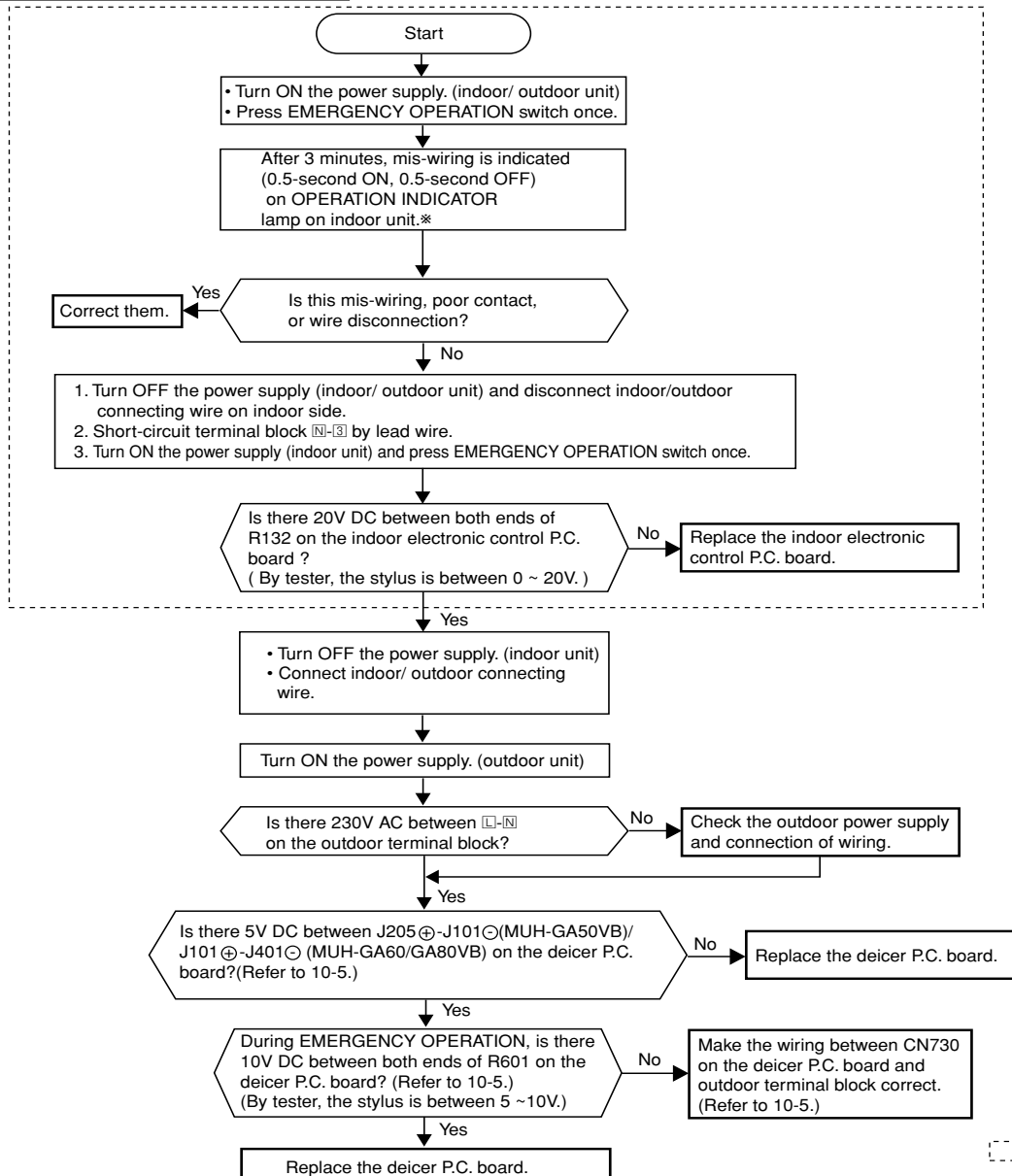
※ First, measure the resistance of R.V. coil to confirm it is disconnected or is not short-circuit.



When OPERATION INDICATOR lamp flashes ON and OFF in every 0.5-second.
Outdoor unit doesn't operate.

④ How to check mis-wiring

※ Short circuit of JPG and JPS on the indoor electronic control P.C. board enables self -check to be displayed in 3 seconds.



Refer to indoor unit service manual.

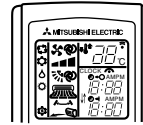
**When OPERATION INDICATOR lamp flashes 10-time.
Heating/ Cooling doesn't operate.**

E Check of LEV (Expansion valve)

MUH-GA80VB

Turn ON the power supply.

- ① During pressing both the OPERATION SELECT button and the TOO COOL button on the remote controller at the same time, press the RESET button.
- ② First, release the RESET button.
And release the other two buttons since all LCD in operation display section of the remote controller is displayed after 3 seconds.



With remote controller set toward the indoor unit, press OPERATE/ STOP (ON/ OFF) button and confirm one beep tone.

LEV operates in full-opening direction.

Do you hear the expansion valve "click, click....."?
Do you feel the expansion valve vibrate on touching it?

Yes

Ok

No

Is LEV properly fixed to the expansion valve?

No

Properly fix the LEV to the expansion valve.

Yes

Does the resistance of LEV have the characteristics on 10-3?

Yes

Replace the deicer P.C. board.

No

Replace the LEV.

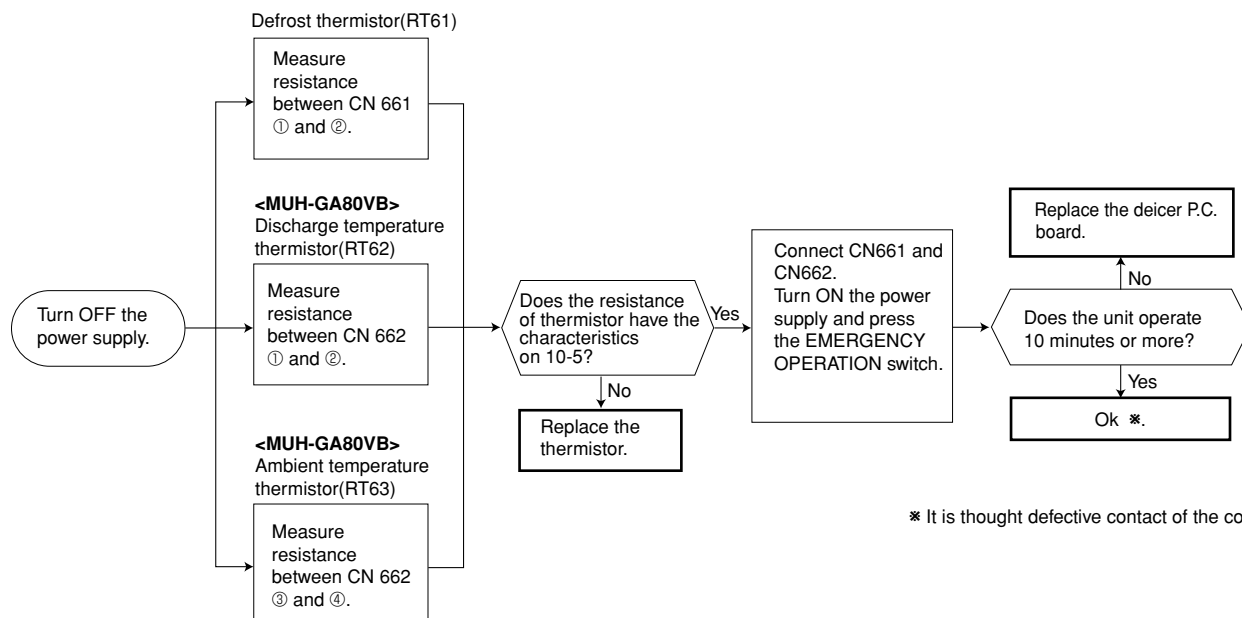
NOTE : After check of LEV, do the undermentioned operations.

1. Turn OFF the power supply and turn ON again.
2. Press the RESET button on the remote controller.

When OPERATION INDICATOR lamp flashes 6-time.
Thermistors in the outdoor unit are abnormal.

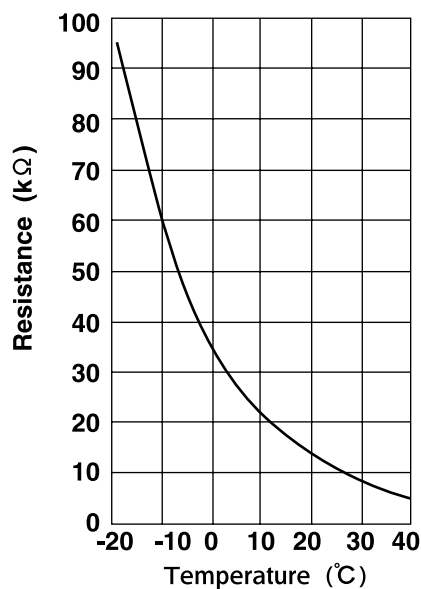
F Check of outdoor thermistor

※ Disconnect the connectors CN661 and/ or CN662 from the deicer P.C. board.
(Check the characteristics of each thermistor.)



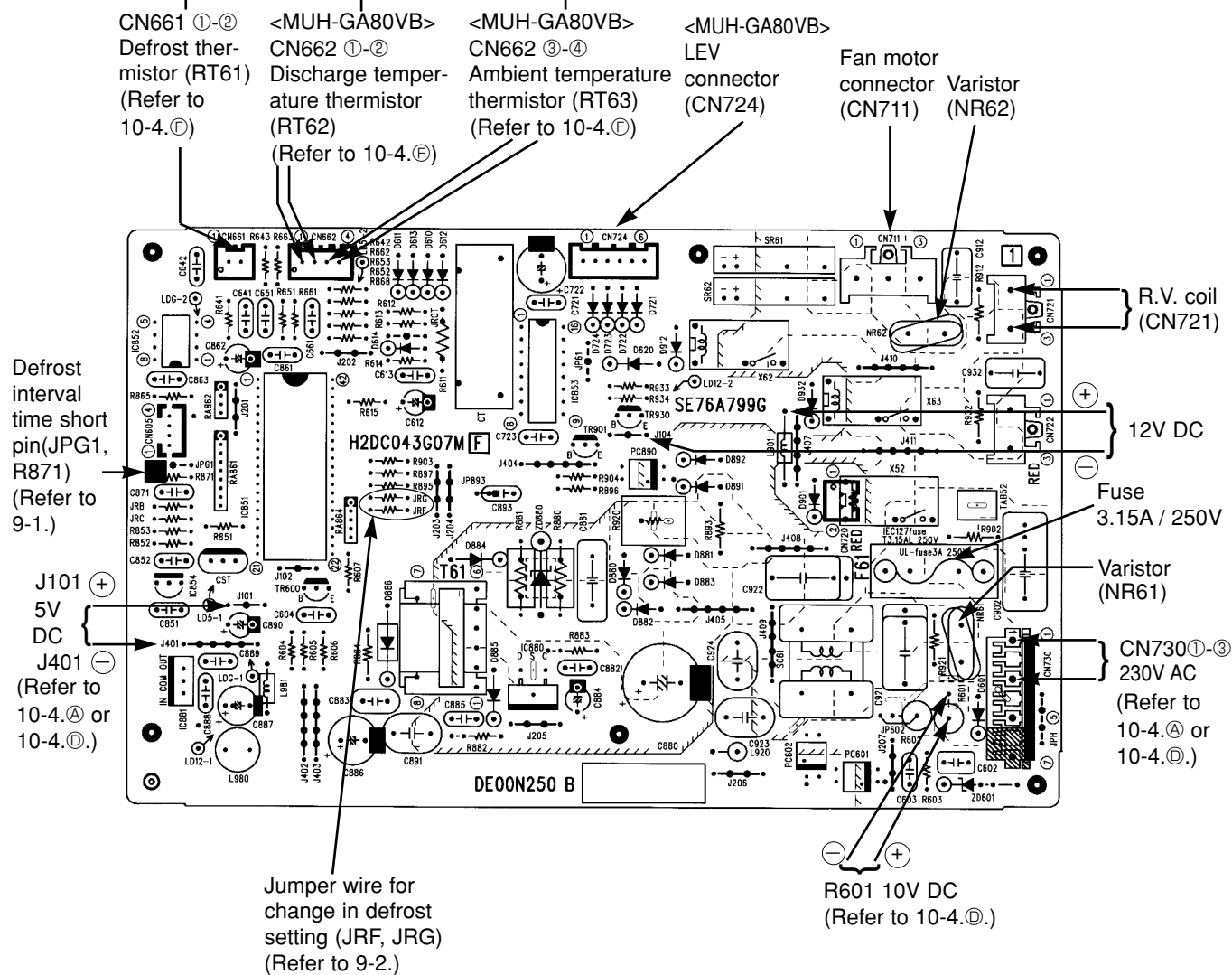
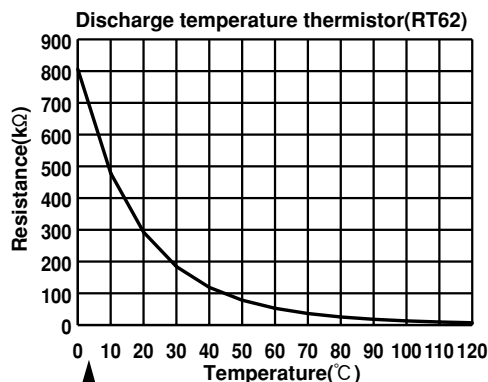
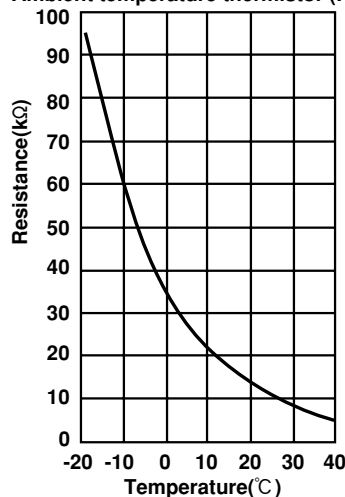
※ It is thought defective contact of the connector.

CN711	CN721
Outdoor fan motor	R.V. coil
230V AC	230V AC



MUH-GA60VB **MUH-GA80VB** **Outdoor deicer P.C. board**

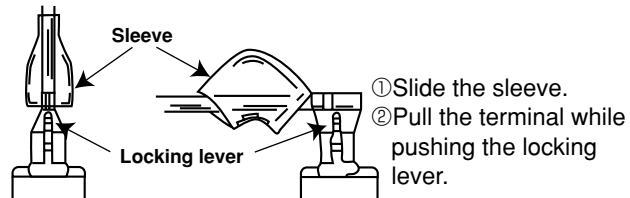
Defrost thermistor (RT61)
 Ambient temperature thermistor (RT63)



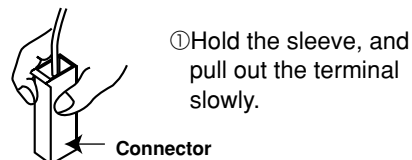
<"Terminal with locking mechanism" Detaching points>

The terminal which has the locking mechanism can be detached as shown below.
There are two types (Refer to (1) and (2)) of the terminal with locking mechanism.
The terminal without locking mechanism can be detached by pulling it out.
Check the shape of the terminal before detaching.

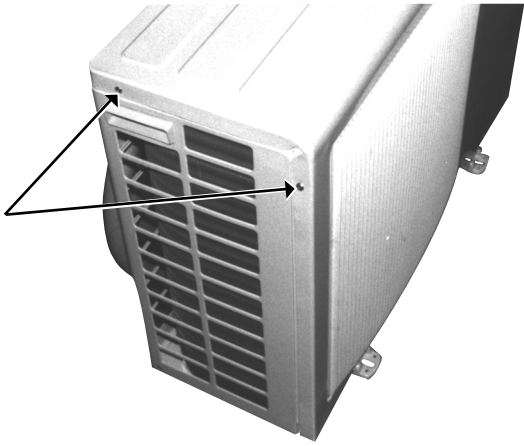
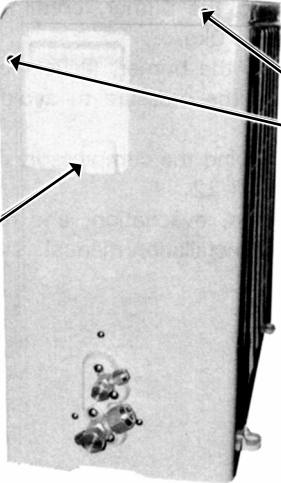
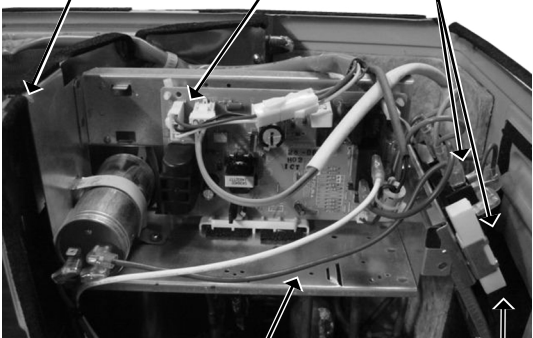
(1) Slide the sleeve and check if there is a locking lever or not.

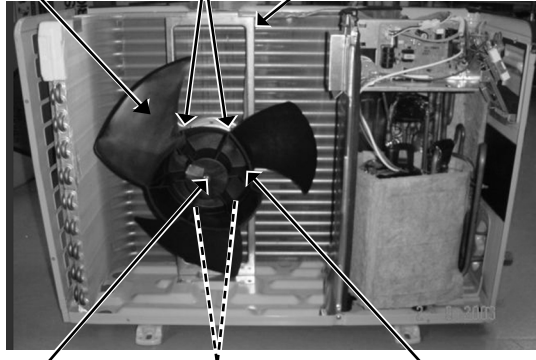



(2) The terminal with this connector has the locking mechanism.



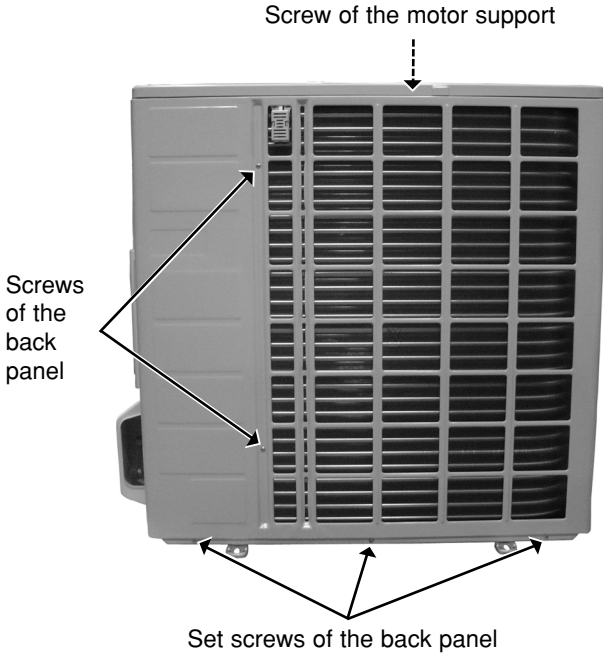
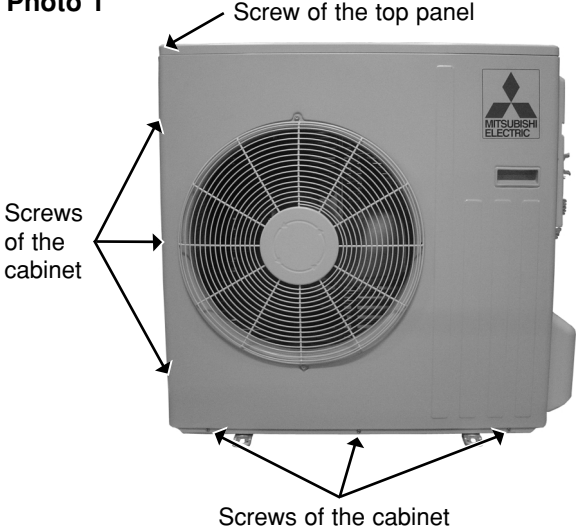
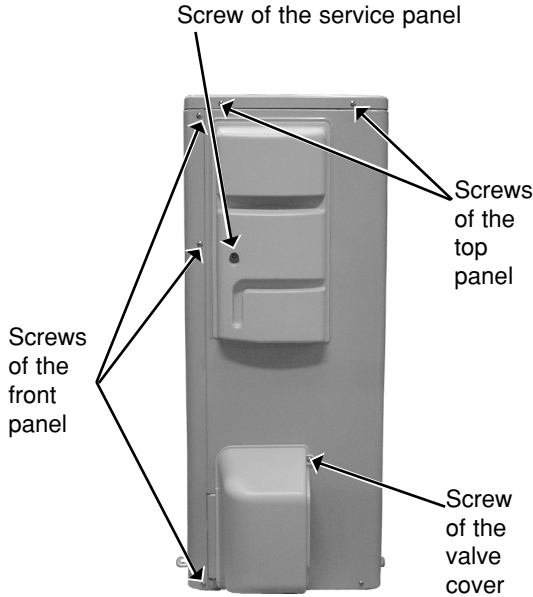
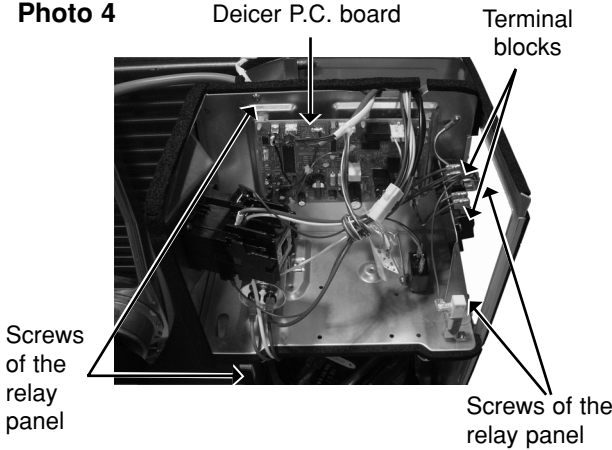
11-1. MUH-GA50VB OUTDOOR UNIT

OPERATING PROCEDURE	PHOTOS
<p>1. Removing the cabinet</p> <p>(1) Remove the screws of the cabinet. (2) Hold the down of the cabinet on the both side and remove the cabinet.</p> <p>Photo 2</p>  <p>Screws of the cabinet</p>	<p>Photo 1</p>  <p>Service panel</p> <p>Screws of the cabinet</p>
<p>2. Removing the deicer P.C. board</p> <p>(1) Remove the service panel and the cabinet. (2) Disconnect all the connectors and the terminals on the deicer P.C. board. (3) Remove the deicer P.C. board.</p>	<p>Photo 3</p>  <p>Screw of the relay panel</p> <p>Deicer P.C. board</p> <p>Terminal blocks</p> <p>Relay panel</p> <p>Screw of the relay panel</p>

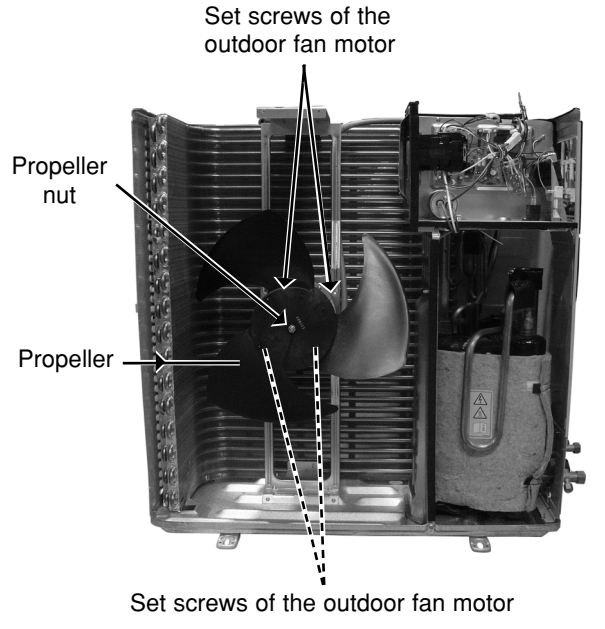
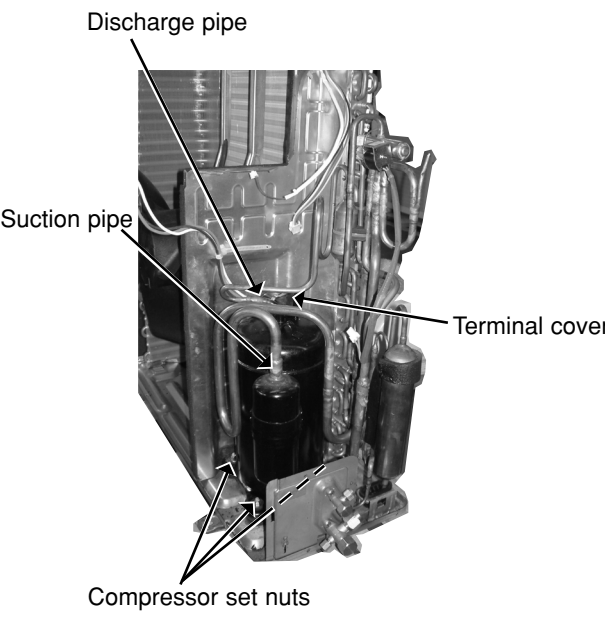
OPERATING PROCEDURE	PHOTOS
<p>3. Removing the propeller and the outdoor fan motor</p> <p>(1) Remove the cabinet. (Refer to 1.)</p> <p>(2) Remove the propeller nut and the propeller.</p> <p>NOTE : Loose the propeller in the rotating direction for removal.</p> <p>When attaching the propeller, align the mark on the propeller and the motor shaft cut section.</p> <p>Set the propeller fan in position by using the cut on the shaft and the mark on the propeller.</p> <p>(3) Remove the clamp of outdoor fan motor lead wire and disconnect the outdoor fan motor connector.</p> <p>(4) Remove the screws fixing the outdoor fan motor.</p> <p>(5) Remove the outdoor fan motor.</p>	<p>Photo 4</p>  <p>Propeller</p> <p>Set screws of the outdoor fan motor</p> <p>Lead clamps</p> <p>Propeller nut</p> <p>Set screws of the outdoor fan motor</p> <p>Outdoor fan motor</p>
<p>4. Removing the compressor</p> <p>(1) Remove the cabinet. (Refer to 1.)</p> <p>(2) Remove the relay panel.</p> <p>(3) Remove the soundproof felt.</p> <p>(4) Remove the terminal cover on the compressor.</p> <p>(5) Disconnect lead wires from the compressor.</p> <p>(6) Recover gas from the refrigerant circuit.</p> <p>(7) Disconnect the welded part of the discharge pipe.</p> <p>(8) Disconnect the welded part of the suction pipe.</p> <p>(9) Remove nuts fixing the compressor.</p> <p>(10) Remove the compressor.</p> <p>NOTE :</p> <p>Recover gas from the pipes until the pressure gauge shows 0 kg/cm² (0 MPa).</p>	<p>Photo 5</p>  <p>Discharge pipe</p> <p>Terminal cover</p> <p>Compressor</p> <p>Suction pipe</p> <p>Compressor set nuts</p>

11-2. MUH-GA60VB MUH-GA80VB OUTDOOR UNIT

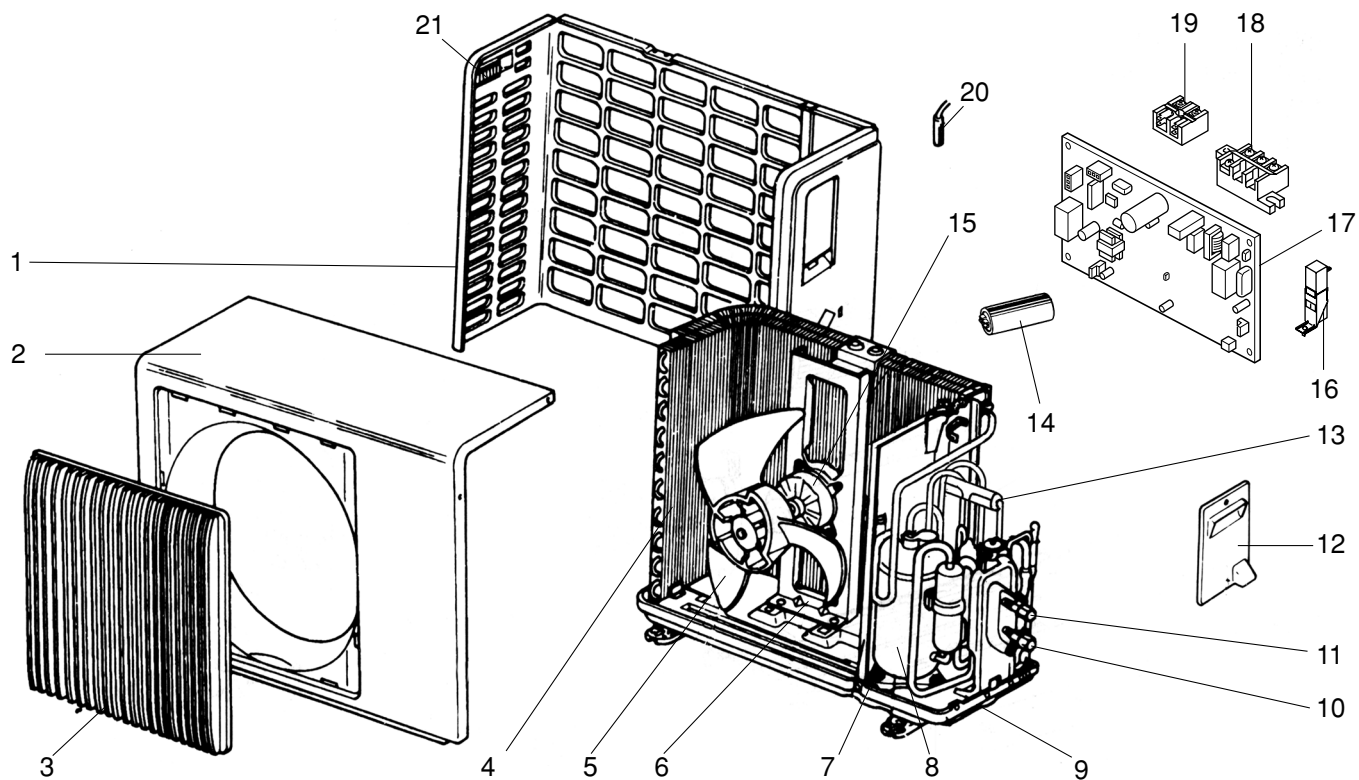
NOTE : These photos are MUH-GA80VB.
MUH-GA60VB is almost the same as MUH-GA80VB.

OPERATING PROCEDURE	PHOTOS
<p>1. Removing the cabinet</p> <ol style="list-style-type: none"> (1) Remove the screws of the service panel. (2) Remove the screws of the top panel. (3) Remove the screw of the valve cover. (4) Remove the service panel. (5) Remove the top panel. (6) Remove the valve cover. (7) Remove the screws of the front panel. (8) Remove the front panel. (9) Remove the screws of the back panel. (10) Remove the back panel. <p>Photo 3</p>  <p>Screw of the motor support</p> <p>Screws of the back panel</p> <p>Set screws of the back panel</p>	<p>Photo 1</p>  <p>Screw of the top panel</p> <p>Screws of the cabinet</p> <p>Screws of the cabinet</p> <p>Photo 2</p>  <p>Screw of the service panel</p> <p>Screws of the top panel</p> <p>Screws of the front panel</p> <p>Screw of the valve cover</p>
<p>2. Removing the deicer P.C. board</p> <ol style="list-style-type: none"> (1) Remove the service panel and the cabinet. (2) Disconnect all the connectors and the terminals on the deicer P.C. board. (3) Remove the deicer P.C. board. 	<p>Photo 4</p>  <p>Deicer P.C. board</p> <p>Terminal blocks</p> <p>Screws of the relay panel</p> <p>Screws of the relay panel</p>

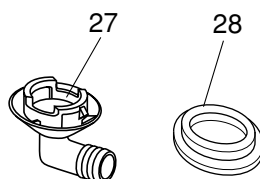


OPERATING PROCEDURE	PHOTOS
<p>3. Removing the propeller and the outdoor fan motor</p> <p>(1) Remove the cabinet. (Refer to 1.)</p> <p>(2) Remove the propeller nut and the propeller.</p> <p>NOTE : Loose the propeller in the rotating direction for removal.</p> <p>When attaching the propeller, align the mark on the propeller and the motor shaft cut section.</p> <p>Set the propeller fan in position by using the cut on the shaft and the mark on the propeller.</p> <p>(3) Remove the clamp of outdoor fan motor lead wire and disconnect the outdoor fan motor connector.</p> <p>(4) Remove the screws fixing the outdoor fan motor.</p> <p>(5) Remove the outdoor fan motor.</p>	<p>Photo 5</p>  <p>Set screws of the outdoor fan motor</p> <p>Propeller nut</p> <p>Propeller</p> <p>Set screws of the outdoor fan motor</p>
<p>4. Removing the compressor</p> <p>(1) Remove the cabinet. (Refer to 1.)</p> <p>(2) Remove the relay panel.</p> <p>(3) Remove the soundproof felt.</p> <p>(4) Remove the terminal cover on the compressor.</p> <p>(5) Disconnect lead wires from the compressor.</p> <p>(6) Recover gas from the refrigerant circuit.</p> <p>(7) Disconnect the welded part of the discharge pipe.</p> <p>(8) Disconnect the welded part of the suction pipe.</p> <p>(9) Remove nuts fixing the compressor.</p> <p>(10) Remove the compressor.</p> <p>NOTE :</p> <p>Recover gas from the pipes until the pressure gauge shows 0 kg/cm² (0 MPa).</p>	<p>Photo 6</p>  <p>Discharge pipe</p> <p>Suction pipe</p> <p>Terminal cover</p> <p>Compressor set nuts</p>

MUH-GA50VB

12-1. OUTDOOR UNIT STRUCTURAL PARTS,
ELECTRICAL PARTS AND FUNCTIONAL PARTS

12-2. ACCESSORY



MUH-GA50VB

12-1. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

Part numbers that are circled are not shown in the illustration.

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUH-GA50VB - E1	
1	E02 817 233	BACK PANEL		1	
2	E02 817 232	CABINET		1	
3	E02 817 521	GRILLE		1	
4	E02 643 630	OUTDOOR HEAT EXCHANGER		1	
5	E02 141 501	PROPELLER		1	
6	E02 139 515	MOTOR SUPPORT		1	
7	E02 075 506	COMPRESSOR RUBBER SET		3	3RUBBERS/SET
8	E02 817 900	COMPRESSOR	MC	1	RN196VHSHT
9	E02 817 290	BASE		1	
10	E02 817 661	STOP VALVE (GAS)		1	φ12.7
11	E02 820 662	STOP VALVE (LIQUID)		1	φ 6.35
12	E02 817 245	SERVICE PANEL		1	
13	E02 891 961	4-WAY VALVE		1	
14	E02 888 353	COMPRESSOR CAPACITOR	C1	1	40μF/ 440V AC
15	E02 816 301	OUTDOOR FAN MOTOR	MF	1	RA6V50 - □□
16	E02 890 383	SURGE ABSORBER	DSAR	1	
17	E02 891 451	DEICER P.C. BOARD		1	
18	E02 817 374	TERMINAL BLOCK	TB1	1	3P
19	E02 821 374	TERMINAL BLOCK	TB2	1	2P
20	E02 820 310	DEFROST THERMISTOR	RT61	1	
21	E02 817 009	HANDLE		1	
22	E02 139 936	CAPILLARY TUBE		2	φ3.0×φ1.6×750
	E02 340 936	CAPILLARY TUBE		1	φ3.0×φ1.6×450
	E02 414 936	CAPILLARY TUBE		1	φ3.0×φ1.6×300
23	E02 095 382	FUSE	F61	1	250V/ 2A
24	E02 821 490	R.V. COIL	21S4	1	
25	E02 891 642	CHECK VALVE		1	
26	E02 336 385	VARISTOR	NR61	1	

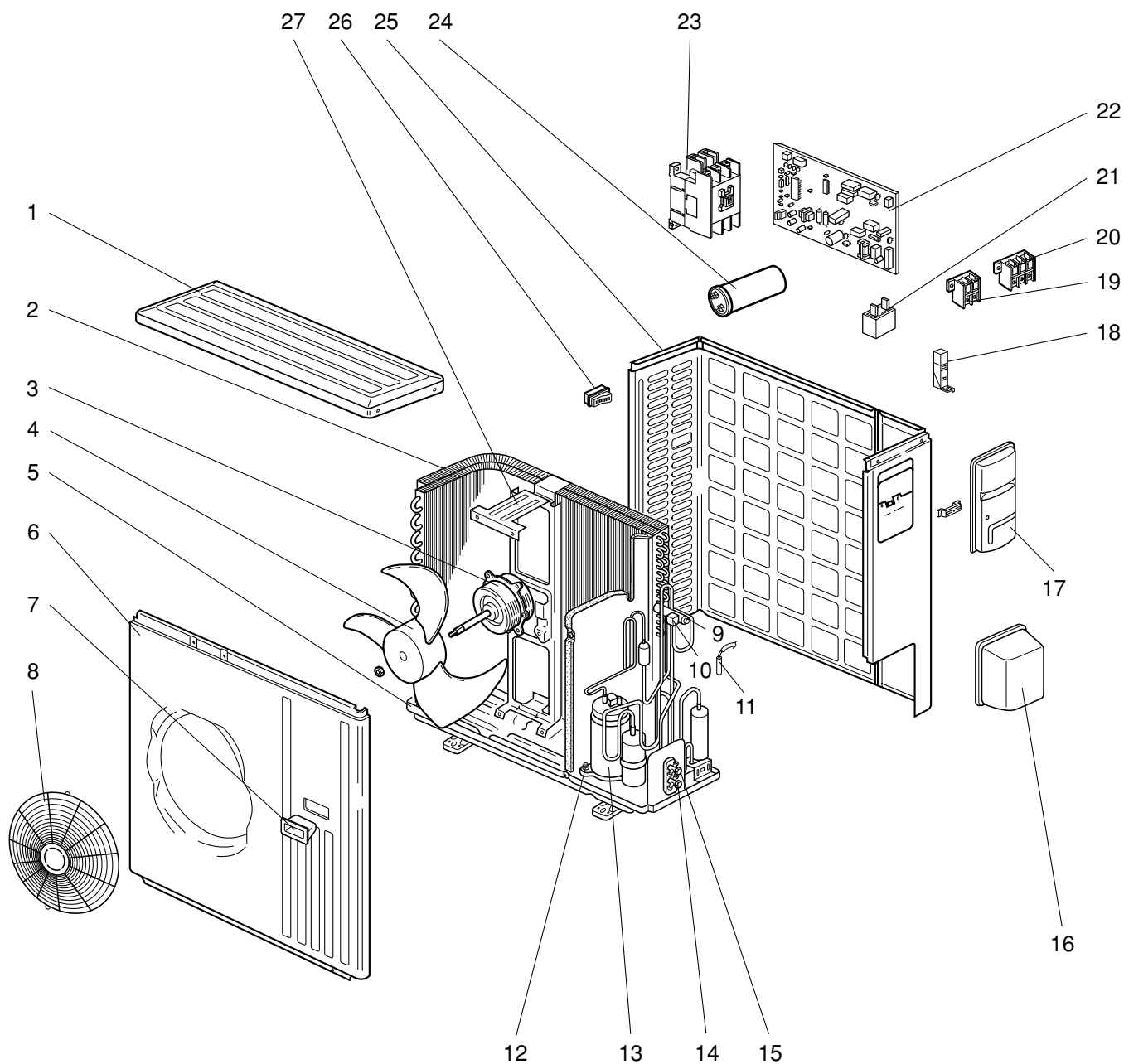
12-2. ACCESSORY

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUH-GA50VB - E1	
27	E02 817 704	DRAIN SOCKET		1	
28	E02 444 705	DRAIN CAP		2	φ33 2PCS/ SET
	E02 444 706	DRAIN CAP		1	φ16

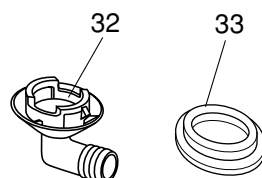
PARTS LIST (non-RoHS compliant)

MUH-GA60VB

12-3. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS



12-4. ACCESSORY



PARTS LIST (non-RoHS compliant)

MUH-GA60VB

12-3. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

Part numbers that are circled are not shown in the illustration.

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUH-GA60VB - [E1]	
1	E02 819 297	TOP PANEL		1	
2	E02 821 630	OUTDOOR HEAT EXCHANGER		1	
3	E02 892 301	OUTDOOR FAN MOTOR	MF	1	RA6V85- □□
4	E02 214 501	PROPELLER		1	
5	E02 821 290	BASE		1	
6	E02 819 232	CABINET		1	
7	E02 819 009	HANDLE		1	
8	E02 819 521	FAN GUARD		1	
9	E02 891 961	4-WAY VALVE		1	
10	E02 B36 490	R.V. COIL	21S4	1	
11	E02 821 310	DEFROST THERMISTOR	RT61	1	
12	E02 527 506	COMPRESSOR RUBBER SET		4	4RUBBERS/ SET
13	E02 821 900	COMPRESSOR	MC	1	NN29VBAHT
14	E02 819 661	STOP VALVE (GAS)		1	φ15.88
15	E02 821 662	STOP VALVE (LIQUID)		1	φ6.35
16	E02 819 650	VALVE COVER		1	
17	E02 819 245	SERVICE PANEL		1	
18	E02 890 383	SURGE ABSORBER	DSAR	1	
19	E02 821 374	TERMINAL BLOCK	TB2	1	2P
20	E02 817 374	TERMINAL BLOCK	TB1	1	3P
21	E02 895 351	OUTDOOR FAN CAPACITOR	C2	1	3.0μF/ 440V AC
22	E02 892 451	DEICER P.C. BOARD		1	
23	E07 012 340	COMPRESSOR CONTACTOR	52C	1	
24	E02 889 353	COMPRESSOR CAPACITOR	C1	1	55μF/ 440V AC
25	E02 819 233	BACK PANEL		1	
26	E02 817 009	HANDLE		1	
27	E02 726 515	MOTOR SUPPORT		1	
28	E02 127 382	FUSE	F61	1	250V/ 3.15A
29	E02 336 385	VARISTOR	NR61	1	
30	E02 891 642	CHECK VALVE		1	
31	E02 892 936	CAPILLARY TUBE		2	φ3.0xφ2.0x750

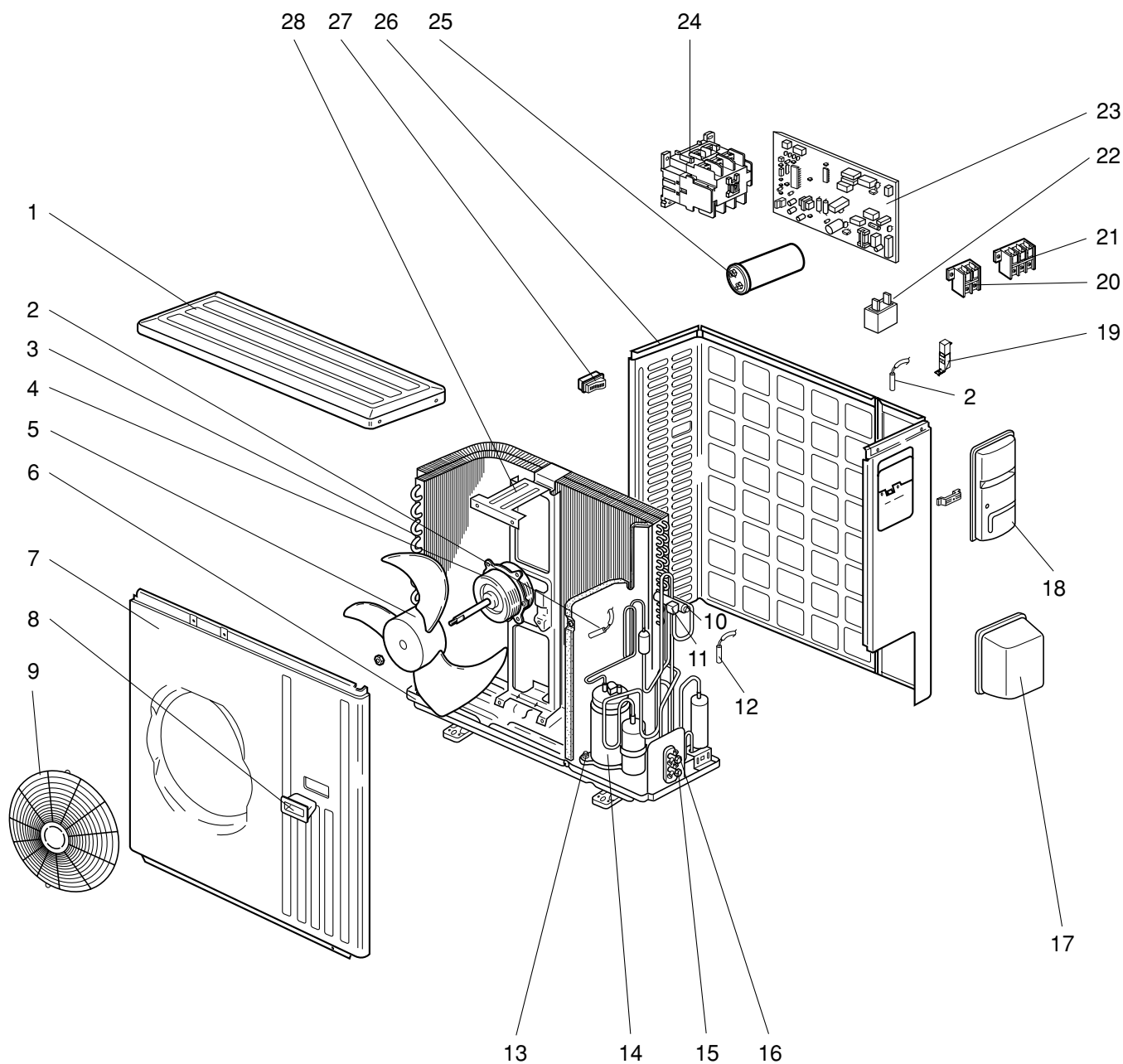
12-4. ACCESSORY

NO.	RoHS	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
					MUH-GA60VB - [E1]	
32	G	E12 817 704	DRAIN SOCKET		1	
33	G	E12 444 705	DRAIN CAP		2	φ33 2PCS/ SET

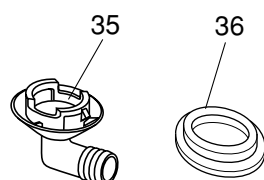
PARTS LIST (non-RoHS compliant)

MUH-GA80VB

12-5. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS



12-6. ACCESSORY



PARTS LIST (non-RoHS compliant)

MUH-GA80VB

12-5. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

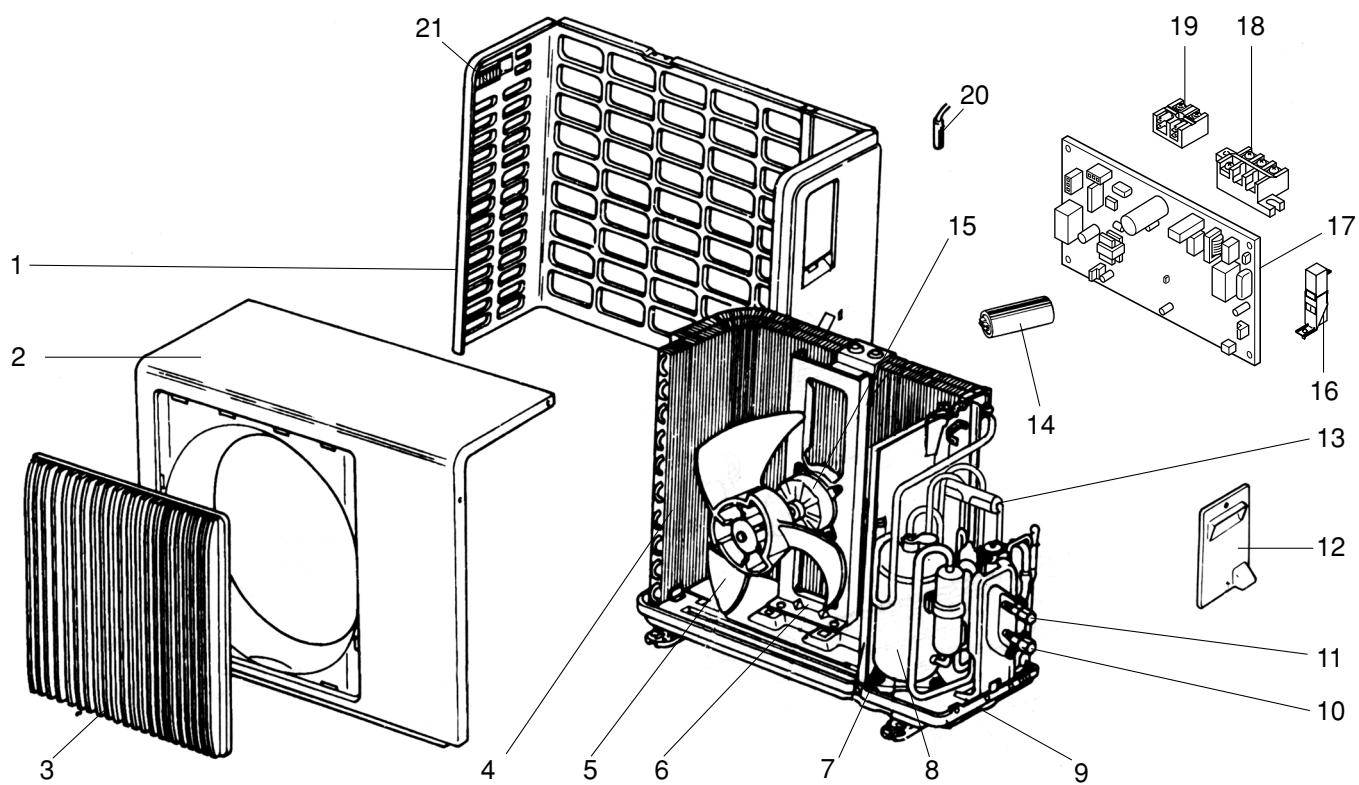
Part numbers that are circled are not shown in the illustration.

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUH-GA80VB - E1	
1	E02 819 297	TOP PANEL		1	
2	E02 819 309	THERMISTOR	RT62, RT63	1	DISCHARGE, AMBIENT
3	E02 822 630	OUTDOOR HEAT EXCHANGER		1	
4	E02 819 301	OUTDOOR FAN MOTOR	MF	1	RA6V75- □□
5	E02 214 501	PROPELLER		1	
6	E02 819 290	BASE		1	
7	E02 819 232	CABINET		1	
8	E02 819 009	HANDLE		1	
9	E02 819 521	FAN GUARD		1	
10	E02 891 961	4-WAY VALVE		1	
11	E02 B36 490	R.V. COIL	21S4	1	
12	E02 821 310	DEFROST THERMISTOR	RT61	1	
13	E02 527 506	COMPRESSOR RUBBER SET		4	4RUBBERS/ SET
14	E02 819 900	COMPRESSOR	MC	1	NN37VAAHT
15	E02 819 661	STOP VALVE (GAS)		1	φ15.88
16	E02 822 662	STOP VALVE (LIQUID)		1	φ9.52
17	E02 819 650	VALVE COVER		1	
18	E02 819 245	SERVICE PANEL		1	
19	E02 890 383	SURGE ABSORBER	DSAR	1	
20	E02 821 374	TERMINAL BLOCK	TB2	1	2P
21	E02 817 374	TERMINAL BLOCK	TB1	1	3P
22	E02 890 351	OUTDOOR FAN CAPACITOR	C2	1	4.0μF/ 440V AC
23	E02 893 451	DEICER P.C. BOARD		1	
24	E02 890 340	COMPRESSOR CONTACTOR	52C	1	
25	E02 890 353	COMPRESSOR CAPACITOR	C1	1	60μF/ 440V AC
26	E02 819 233	BACK PANEL		1	
27	E02 817 009	HANDLE		1	
28	E02 726 515	MOTOR SUPPORT		1	
29	E02 819 640	EXPANSION VALVE		1	
30	E02 819 493	EXPANSION VALVE COIL	LEV	1	
31	E02 127 382	FUSE	F61	1	250V/ 3.15A
32	E02 336 385	VARISTOR	NR61	1	
33	E02 214 386	CZ SURGE ABSORBER	CZ	1	
34	E02 822 936	CAPILLARY TUBE (TAPER PIPE)		1	φ3.6xφ2.4x50

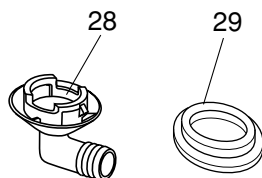
12-6. ACCESSORY

NO.	RoHS	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
					MUH-GA80VB - E1	
35	G	E12 817 704	DRAIN SOCKET		1	
36	G	E12 444 705	DRAIN CAP		2	φ33 2PCS/ SET

MUH-GA50VB

13-1. OUTDOOR UNIT STRUCTURAL PARTS,
ELECTRICAL PARTS AND FUNCTIONAL PARTS

13-2. ACCESSORY







RoHS PARTS LIST (RoHS compliant)

MUH-GA50VB

13-1. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

Part numbers that are circled are not shown in the illustration.

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit		Remarks
				MUH-GA50VB		
				- 	- 	
1	E02 817 233	BACK PANEL		1		
	E02 A27 233	BACK PANEL			1	
2	E02 817 232	CABINET		1	1	
3	E02 817 521	GRILLE		1	1	
4	E02 643 630	OUTDOOR HEAT EXCHANGER		1		
	E02 B35 630	OUTDOOR HEAT EXCHANGER			1	
5	E02 141 501	PROPELLER		1	1	
6	E02 139 515	MOTOR SUPPORT		1	1	
7	E02 075 506	COMPRESSOR RUBBER SET		3	3	3RUBBERS/SET
8	E02 817 900	COMPRESSOR	MC	1	1	RN196VHSHT
9	E02 817 290	BASE		1		
	E02 A27 290	BASE			1	
10	E02 817 661	STOP VALVE (GAS)		1	1	φ12.7
11	E02 820 662	STOP VALVE (LIQUID)		1	1	φ 6.35
12	E02 817 245	SERVICE PANEL		1	1	
13	E02 891 961	4-WAY VALVE		1	1	
14	E02 888 353	COMPRESSOR CAPACITOR	C1	1	1	40μF/ 440V AC
15	E02 816 310	OUTDOOR FAN MOTOR	MF	1		RA6V50 - 
	E02 816 310	OUTDOOR FAN MOTOR	MF		1	RA6V60 - 
16	E02 890 383	SURGE ABSORBER	DSAR	1	1	
17	E02 891 451	DEICER P.C. BOARD		1		
	E02 B35 451	DEICER P.C. BOARD			1	
18	E02 817 374	TERMINAL BLOCK	TB1	1	1	3P
19	E02 821 374	TERMINAL BLOCK	TB2	1	1	2P
20	E02 820 310	DEFROST THERMISTOR	RT61	1	1	
21	E02 817 009	HANDLE		1	1	
22	E02 139 936	CAPILLARY TUBE		2	2	φ3.0×φ1.6×750
	E02 340 936	CAPILLARY TUBE		1		φ3.0×φ1.6×450
	E02 414 936	CAPILLARY TUBE		1		φ3.0×φ1.6×300
	E02 888 936	CAPILLARY TUBE			1	φ3.0×φ1.6×350
	E02 140 936	CAPILLARY TUBE			1	φ3.0×φ1.8×800
	E02 938 936	CAPILLARY TUBE			1	φ3.0×φ1.6×1000
23	E02 095 382	FUSE	F61	1	1	250V/ 2A
24	E02 821 490	R.V. COIL	21S4	1	1	
25	E02 891 642	CHECK VALVE		1	1	
26	E02 336 385	VARISTOR	NR61	1	1	
27	E02 B36 299	OIL SEPARATOR			1	

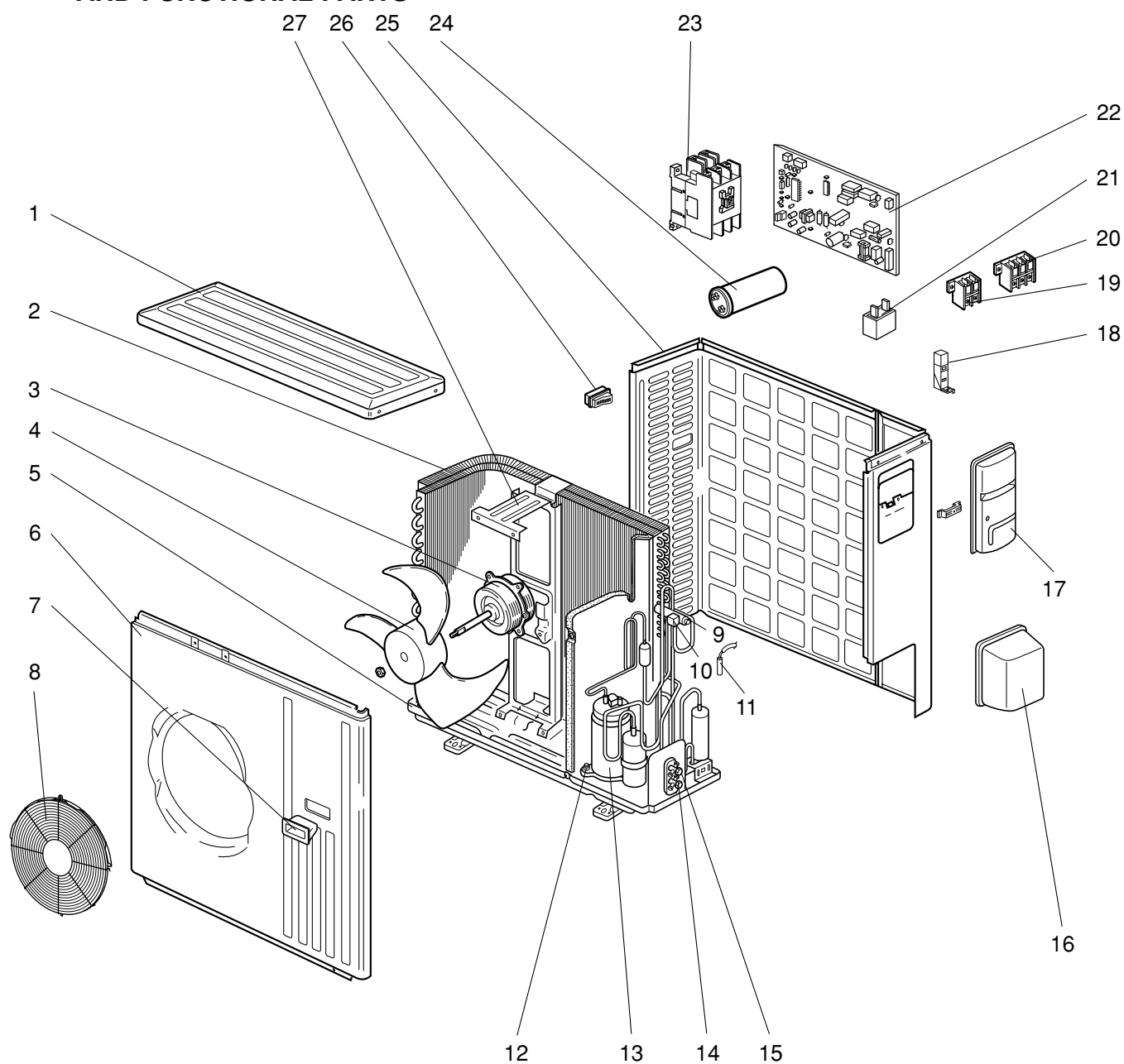
13-2. ACCESSORY

NO.	RoHS	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit		Remarks
					MUH-GA50VB -		
					E1	E2	
28	G	E12 817 704	DRAIN SOCKET		1	1	
29	G	E12 444 705	DRAIN CAP		2	2	φ33 2PCS/ SET
	G	E12 444 706	DRAIN CAP		1	1	φ16

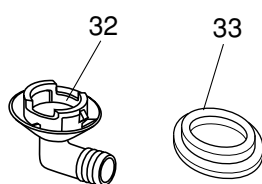
RoHS PARTS LIST (RoHS compliant)

MUH-GA60VB

13-3. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS



13-4. ACCESSORY



RoHS PARTS LIST (RoHS compliant)

MUH-GA60VB

13-3. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

Part numbers that are circled are not shown in the illustration.

NO.	RoHS	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
					MUH-GA60VB - [E1]	
1	G	E12 819 297	TOP PANEL		1	
2	G	E12 821 630	OUTDOOR HEAT EXCHANGER		1	
3	G	E12 892 301	OUTDOOR FAN MOTOR	MF	1	RA6V85-□□
4	G	E12 214 501	PROPELLER		1	
5	G	E12 821 290	BASE		1	
6	G	E12 819 232	CABINET		1	
7	G	E12 819 009	HANDLE		1	
8	G	E12 D84 521	FAN GUARD		1	Including ice guard
9	G	E12 891 961	4-WAY VALVE		1	
10	G	E12 B36 490	R.V. COIL	21S4	1	
11	G	E12 821 310	DEFROST THERMISTOR	RT61	1	
12	G	E12 527 506	COMPRESSOR RUBBER SET		4	4RUBBERS/ SET
13	G	E12 821 900	COMPRESSOR	MC	1	NN29VBAHT
14	G	E12 819 661	STOP VALVE (GAS)		1	φ15.88
15	G	E12 821 662	STOP VALVE (LIQUID)		1	φ6.35
16	G	E12 819 650	VALVE COVER		1	
17	G	E12 819 245	SERVICE PANEL		1	
18	G	E12 890 383	SURGE ABSORBER	DSAR	1	
19	G	E12 821 374	TERMINAL BLOCK	TB2	1	2P
20	G	E12 817 374	TERMINAL BLOCK	TB1	1	3P
21	G	E12 895 351	OUTDOOR FAN CAPACITOR	C2	1	3.0μF/ 440V AC
22	G	E12 892 451	DEICER P.C. BOARD		1	
23	G	E17 012 340	COMPRESSOR CONTACTOR	52C	1	
24	G	E12 889 353	COMPRESSOR CAPACITOR	C1	1	55μF/ 440V AC
25	G	E12 819 233	BACK PANEL		1	
26	G	E12 817 009	HANDLE		1	
27	G	E12 726 515	MOTOR SUPPORT		1	
28	G	E12 A49 382	FUSE	F61	1	250V/ 3.15A
29	G	E12 336 385	VARISTOR	NR61	1	
30	G	E12 891 642	CHECK VALVE		1	
31	G	E12 892 936	CAPILLARY TUBE		2	φ3.0xφ2.0x750

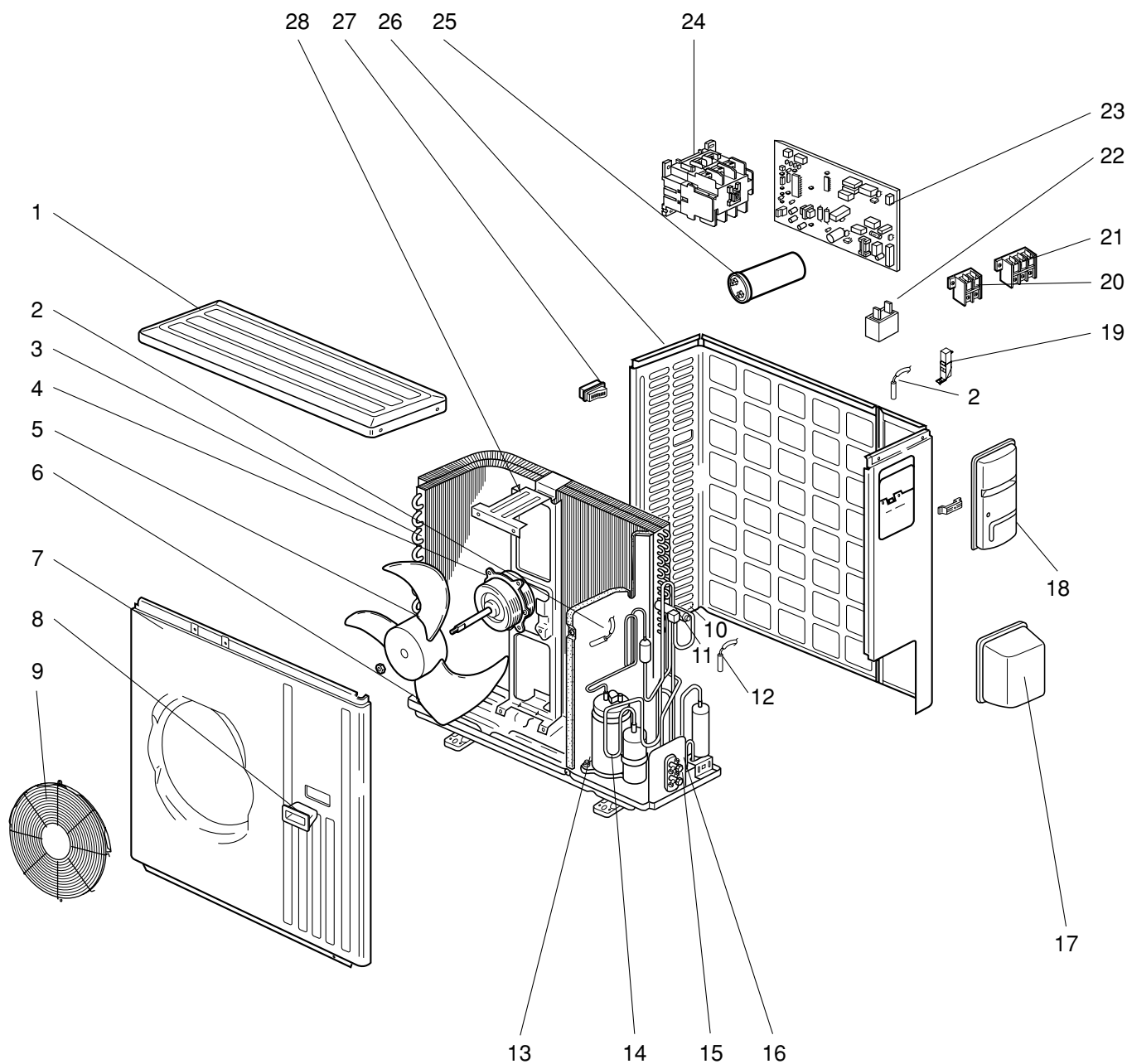
13-4. ACCESSORY

NO.	RoHS	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
					MUH-GA60VB - [E1]	
32	G	E12 817 704	DRAIN SOCKET		1	
33	G	E12 444 705	DRAIN CAP		2	φ33 2PCS/ SET

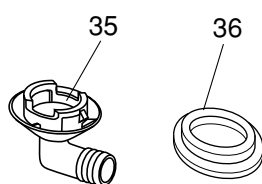
RoHS PARTS LIST (RoHS compliant)

MUH-GA80VB

13-5. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS



13-6. ACCESSORY



RoHS PARTS LIST (RoHS compliant)

MUH-GA80VB

13-5. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

Part numbers that are circled are not shown in the illustration.

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUH-GA80VB - E1	
1	E02 819 297	TOP PANEL		1	
2	E02 819 309	THERMISTOR	RT62, RT63	1	DISCHARGE, AMBIENT
3	E02 822 630	OUTDOOR HEAT EXCHANGER		1	
4	E02 819 301	OUTDOOR FAN MOTOR	MF	1	RA6V75- □□
5	E02 214 501	PROPELLER		1	
6	E02 819 290	BASE		1	
7	E02 819 232	CABINET		1	
8	E02 819 009	HANDLE		1	
9	E12 D84 521	FAN GUARD		1	Including ice guard
10	E02 891 961	4-WAY VALVE		1	
11	E02 B36 490	R.V. COIL	21S4	1	
12	E02 821 310	DEFROST THERMISTOR	RT61	1	
13	E02 527 506	COMPRESSOR RUBBER SET		4	4RUBBERS/ SET
14	E02 819 900	COMPRESSOR	MC	1	NN37VAAHT
15	E02 819 661	STOP VALVE (GAS)		1	φ15.88
16	E02 822 662	STOP VALVE (LIQUID)		1	φ9.52
17	E02 819 650	VALVE COVER		1	
18	E02 819 245	SERVICE PANEL		1	
19	E02 890 383	SURGE ABSORBER	DSAR	1	
20	E02 821 374	TERMINAL BLOCK	TB2	1	2P
21	E02 817 374	TERMINAL BLOCK	TB1	1	3P
22	E02 890 351	OUTDOOR FAN CAPACITOR	C2	1	4.0μF/ 440V AC
23	E02 893 451	DEICER P.C. BOARD		1	
24	E02 890 340	COMPRESSOR CONTACTOR	52C	1	
25	E02 890 353	COMPRESSOR CAPACITOR	C1	1	60μF/ 440V AC
26	E02 819 233	BACK PANEL		1	
27	E02 817 009	HANDLE		1	
28	E02 726 515	MOTOR SUPPORT		1	
29	E02 819 640	EXPANSION VALVE		1	
30	E02 819 493	EXPANSION VALVE COIL	LEV	1	
31	E02 A49 382	FUSE	F61	1	250V/ 3.15A
32	E02 336 385	VARISTOR	NR61	1	
33	E02 214 386	CZ SURGE ABSORBER	CZ	1	
34	E02 822 936	CAPILLARY TUBE (TAPER PIPE)		1	φ3.6xφ2.4x50

13-6. ACCESSORY

NO.	RoHS	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
					MUH-GA80VB - E1	
35	G	E12 817 704	DRAIN SOCKET		1	
36	G	E12 444 705	DRAIN CAP		2	φ33 2PCS/ SET



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